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EDITED BY
I. MINIS HAYS, A.M., M.D.

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THE
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OF THE MEDICAL SCIENCES.

JULY, 1890.

A CONTRIBUTION TO BRAIN SURGERY.

SIX SEVERE OPERATIONS ENTAILING PROLONGED MANIPULATION
OF THE ENCEPHALON.

REPORTED BY JACOB FRANK, M.D.,

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AND

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CASE I. *Terminal dementia of alleged traumatic origin. Trephining and exploration of brain, with great improvement, lasting nine months; relapse. Second operation; marked and increasing improvement.*—May M., æt. twenty-eight, American by birth and parentage, and of good education; of rather slight physique but always in fair health. There is no family taint of insanity or personal history of neurotic tendency or mental instability. In April, 1884, she became deranged, the mental disability continuously increasing. In July of the same year she was admitted to the Illinois Hospital for the Insane, at Elgin, in the service of Dr. Church, and entered on the records as a case of subacute mania. The father, a very well educated and intelligent man, subsequently stated that the only assignable cause for his daughter's alienation was a knock she had given her head in coming up a cellar stairway. She was stunned by the blow and delirium lasting a few hours resulted. The details of this accident, coming through third parties, are not entirely reliable, and the portion of the head struck could only be inferred. A few days afterward a lady whom she was visiting thought her "out of her head." Gradually she grew worse, and finally was so unmanageable, though never violent, as to require hospital treatment and restraint. During her residence in the asylum she never mani-

fested any symptoms of head injury or indications of focal trouble in the cortex, but her mania ran an ordinary course to a chronic stage and complete dementia. She became filthy in her habits, at times destructive of clothing, at times noisy, but for the most part sat idly, silently, stupidly wherever placed, indifferent alike to spoken directions and the demands of nature. In this condition she was discharged from the hospital and removed to her home as incurable, January 1, 1889.

The father had elaborated and tenaciously clung to the idea that traumatism was the cause of his daughter's insanity. He gave the case his constant study, made casts of her head, and urged that surgical measures be taken because a slight flattening of the skull over the right coronal suture led him to suspect fracture of the inner table, or compression. While at the asylum several consultations were held to determine the advisability of the operative interference he desired, without confirming his views and equally without shaking his opinion.

February 23, 1889. Admitted to St. Elizabeth's Hospital under the care of Dr. Frank. It was noted that she walked with a shuffling gait and dejected air, that she was constantly muttering and had a vacant look, wandering aimlessly about, picking and tearing at her clothing, and that she was heedless of the calls of nature, often soiling herself. It was impossible to attract her attention for a moment. She had to be fed by the nurse, and this was only accomplished with much persistence and difficulty. Examination of chest, abdominal and pelvic organs detected nothing wrong. There was no paralysis, or abnormalities of general sensation, or the reflexes. Dr. W. Franklin Coleman, ophthalmologist to the hospital, examined her eyes and made the following report:

"Reads most letters of No. XX. Snellen at twenty feet with either eye. She will not name some of the letters of No. XX., probably on account of her mental condition. With the ophthalmoscope refraction is emmetropic. The fundus of each eye looks normal in every respect. An attempt to test the ocular muscles with prisms failed to elicit any answers. The excursions of the eyes and the associated movements are apparently normal."

When the head was shaven there was some lack of symmetry, the right parietal surface anteriorly being lower than the left. There was no abrupt depression or traces of injury upon the scalp, and as a brother exhibited exactly the same conformation, it was considered congenital and it was decided not to operate. The father, however, persisted that an operation be done and was anxious to assume all risk, feeling that the girl might better be dead than in the condition she then presented. He asserted his determination to take her from one surgeon to another until some one was found to undertake the surgical measures he felt sure would relieve her. At this time she was seen by Dr. Brower, Professor of Mental Diseases in Rush Medical College, etc., who gave the following written opinion, January 26, 1889:

"After consideration of your daughter's case I have reached the following conclusions:

"1. That the insanity was caused by the injury, because of the absence of any other possible cause and the immediate connection between the two.

"2. That the injury need not have produced fracture or depression of the skull to have resulted in insanity.

"3. That the depression of the skull of your daughter, may be congenital,

but its situation with reference to the injury makes it possible that it may have been produced by it.

"4. This probability justifies exploration of the surface of the skull, and possibly trephining.

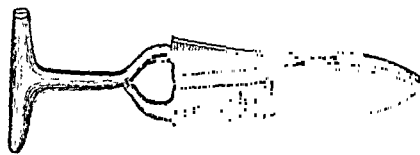
"5. That it is not unreasonable that even if the insanity is due to the injury the long duration of the disease may make the result of the operation negative.

"6. That the danger of the operation is so slight that it should not weigh against the possible benefit."

In consequence of this opinion, in which Dr. M. H. Luken, Attending Physician to St. Elizabeth's Hospital, entirely concurred, and the father's determination, it was decided to operate, and if nothing were found in the skull-cap or meninges to explore the brain itself.

April 2, 1889. The head was again shaved and the patient given a sublimate bath, after which the head was thoroughly scrubbed, cleansed with sublimate solution and enveloped in an antiseptic dressing to await operation, which was done the next day (April 3d) by Dr. Frank, in the presence of Drs. Holmes, Newman, and Hall, with the assistance of the hospital staff and Dr. Luken. Chloroform was used. The head was once more thoroughly washed with sublimate solution and the part of the skull to be attacked—namely, the slight depression in the right anterior parietal region—marked out upon the scalp. With a small drill the scalp was transfixed and the cranium scored that the proper position might be readily found after the scalp should be lifted. The field of operation was then embraced in a horseshoe-shaped line of interlocking silk stitches, which, being tightened and tied, completely controlled hemorrhage. An incision was made within the row of stitches, forming a flap with its base toward the brow, its convexity posteriorly and including the periosteum. The flap was rapidly separated from the cranium and bleeding points on its margin were secured by hæmostatic spring clip forceps, especially devised by Dr. Frank, having a wide transverse bite to prevent crushing and at the same time to include a larger portion of the flap's edge than could be controlled by an ordinary instrument.

FIG. 1.



Spring-clip forceps for controlling hemorrhage from margin of scalp flap.
Two-thirds actual size.

By means of a suture to the brow the flap was kept out of the way and four buttons of bone, three-quarters of an inch in diameter, were removed by an ordinary conical trephine. These were immediately placed in a bowl of warm sterilized water to which an assistant gave scrupulous attention, maintaining the temperature as nearly as possible at 99° F. With the rongeur the cranial opening was freed from its sharp points and bridges of bone and the margins properly smoothed, all fragments and chips being placed with the buttons in the warm water. No

indications of traumatism were presented by the portions of bone removed or by the exposed dura, which showed the normal cerebral pulsations and did not bulge into the opening. The finger, swept widely around between the dura and the skull in all directions, encountered only normal anatomical points.

Two branches of the middle meningeal artery were ligated by passing an armed needle under them, and the dura was opened at a distance of one-quarter of an inch from the bony margin, care being exercised to interfere as little as might be with its blood supply, in order to preserve its vitality—upon which, of course, depend its primary union and the prevention of cerebral hernia. With this in view the base of the flap was formed toward the body, from which direction it receives its blood. When turned down it was protected from abrasion by instruments or the sharp edge of bone by a few folds of warm gauze, and secured in a favorable position by a suture to the ear.

Immediately upon opening the dura there was a gush of cerebro-spinal fluid, probably four ounces at once escaping, and the arachnoid and pia looked œdematous and jelly-like, all the meshes being filled with the same colorless fluid. The under surface of the dura was palpated in all directions as far as the length of the finger permitted, except across the median plane, where it was stopped by the falx. In this way the sharp margin of the lesser wing of the sphenoid and the ridge of the petrous portion of the temporal were readily made out. The œdematous arachnoid presented high vascularity and threatened serious hemorrhage if interfered with. In attempting to take up the engorged vessels the tissues tore through, but surprisingly slight bleeding ensued. Consequently, with dissecting forceps in each hand the turgid vascular membranes were freely stripped from the convolutions over the entire field of operation and the flow of blood was readily controlled by a little pressure. With fingers and a spoon handle the sulci were carefully opened and examined but nothing abnormal could be found. Finally, a minute portion of the brain tissue was removed for microscopical examination. The cortical region exposed embraced the ascending convolutions in the area for the arm centres and the middle third of Rolando's fissure. The irrigator was freely employed, charged with sterilized water, at all stages of the work.

All bleeding parts having been controlled the dura was replaced and secured by catgut sutures in accurate position, a drainage-tube full of iodoform wicking being passed under one corner and lying on the surface of the brain. The buttons of bone and all small chips and fragments were replaced and iodoform wicking packed in, around, and between them for the purpose of drainage and to assist in maintaining them in position, the strands coming out with the brain drainage at the most dependent portion of the scalp wound, which was closed with numerous suture points. The interlocking stitches were then removed, the head properly cleansed, and completely enveloped in a very ample antiseptic gauze dressing.

The patient rallied nicely from the anæsthetic, passed a quiet night, and no untoward symptoms were developed at any time. The temperature never reached 100° F.

No convulsions, vomiting, or stupor appeared, but a gradual gain in mental power, memory, habits of cleanliness, and deportment was noted from the first.

The condensed daily record follows:

April 4. Asked for a vessel, a thing she had not known enough to do for years, and is brighter mentally.

6th. The drainage-tube was removed. There has been a considerable discharge of cerebro-spinal fluid on the dressings.

9th. Motor power in left hand diminishing, probably from interference with the arm-centre at the time of operation. Began to menstruate the first time in many months.

10th. Not so bright mentally, and seems in danger of relapse into her former demented condition.

11th. Head dressed. Is up and around room eight days after operation.

13th. No control of muscles of left arm. Answers questions rationally and readily. Received a letter from her father which she enjoyed and read without a mistake. Commenced a reply this afternoon, but after a few words lost coherence.

15th. Left arm blue and cold, but sensation is not appreciably impaired.

16th. Mind growing stronger, and she is cleanly in her habits.

20th. Visited by her father, who saw much improvement in her condition.

22d. No reaction to faradism in left forearm and hand. The replaced bone buttons seem firmly united.

26th. Paralysis diminishing. There is slight voluntary movement in flexors.

27th. Faradic and voluntary contractions in muscles of left arm and forearm increasing.

28th. Color of hand normal, but still colder than its fellow. Patient is quiet in deportment and answers all questions rationally and correctly.

May 1. Paralysis completely gone. Wound in scalp healed soundly by first intention, and there is firm union between the buttons of bone and the cranium—the conformation of the skull being much what it was before operating. To-day had eyes examined by Dr. W. Franklin Coleman, who reports as follows:

“The ocular muscles are examined especially as a test of the patient’s present intelligence. During the previous examination she kept up a constant muttering and could not be induced to hold her head quiet, which made the examination of the fundus somewhat difficult. Her manner is now quiet and attentive, still with an air of sadness. She answers promptly questions concerning her residence, age, etc., though she states she is seventeen. Upon testing her ocular muscles by prisms and a lamp at twenty feet, her answers are now remarkably prompt and consistent, even during tests for adduction, abduction, hyperphoria, etc., which were many times repeated. As an evidence of very intelligent observation, I cite the report of one test. Diplopia is produced with a prism base up before the left eye, and then the base is inclined toward the median line. She readily and correctly described the lower image belonging to the left eye as ‘horizontal,’ ‘out of the vertical,’ and ‘to the left side of the upper.’

“At twenty feet adduction—right eye, 5° ; left eye, 3° . Abduction, right eye, 5° ; left eye, 6° . No hyperphoria. I have examined the ocular muscles of many patients whose mental capacity was unques-

tioned, who did not give more ready and intelligent answers than the above patient. The transformation in the mental action of the patient in so short a time after operation is the most gratifying and phenomenal instance I have seen."

4th. Patient was discharged and returned to her home in the country.

The following account of her conduct and condition after leaving the hospital is furnished by her father, who watched her carefully and intelligently, and Fig. 2 is from a photograph taken two months after the operation.

February 21, 1890. "On arriving home my daughter's friends observed that she was weak in body. Her mental health presented a great change. As near as we could determine she was no longer insane.

FIG. 2.



From a photograph taken two months after the first operation.

The utter disregard of the calls of nature, which had characterized her conduct for nearly five previous years, had entirely changed, and this improvement has continued from that time, with one minor exception, until the 10th of this month. Her mental powers were very feeble. At first she could not remember her own mother's name, and she had the idea that she had been at the asylum only four months instead of four and a half years. A week or so after her return she gave me correctly the names of the Presidents. Her memory of former years returned so that it was fully as good as that of the other children. Through the summer and early autumn she would help the children with difficult problems in arithmetic, and much of her schooling returned to her. She gained in bodily strength, doing a share of the housework, mending her own garments, attending to her room, and once in a while cooking a meal for the family. Without great care on our

part she would eat too heartily, which would be followed by spitting up of food. This habit was entirely overcome, and has not troubled her for two months past.

"Some time in August she had a very light fit, my wife thinking at the time that she was only choking a little. About four weeks later she had another, somewhat more severe, and then at intervals of about a month three more quite severe ones, losing consciousness, foaming at the mouth, with thumbs of one or both hands turned upon the palm. Subsequently, at the menstrual periods she had lighter fits. The menses have been regular, sufficient in quantity, and of proper color. Following the fits for two or three days she would seem more than usually childish and simple. We began to fear her insanity was to return, and these fears were realized about the 1st of this month, untidiness appearing. She seems in better physical health than a year ago, but the character of her insanity is quite the same as of old."

February 27, 1890. The patient was readmitted to the St. Elizabeth's Hospital in a comparatively fair physical condition, but mentally she was nearly as bad as before the operation, yet with more activity and presenting moments of good behavior and of industry. It was impossible to fix her attention except momentarily. She would wander aimlessly about and was very disorderly, untidy, and regardless of all propriety.

March 17. She was shown before the Chicago Medical Society and another operation in the same region was advised by Dr. Dewey, Superintendent of the Illinois Eastern Hospital for the Insane, at Kankakee, and by Drs. Brower, Luken, and Church, of Chicago, to determine the condition of the skull at that point and that of the underlying parts. The convulsions dictated the election of this site, and with the improvement formerly obtained, and possibly now to be expected, justified renewal surgical interference.

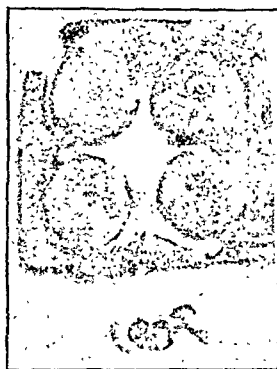
SECOND OPERATION.—*March 24, 1890.* Having been prepared for the operation as before, Dr. Frank operated in the presence of Drs. Steele and Church, and with the assistance of Drs. Luken, Lawson, Beard, and Shuman. Chloroform was employed.

A line of interlocking stitches was placed about one-half inch outside the horseshoe-shaped cicatricial line of the former incision. By alternating black and white silk they were readily selected, and, when tied, completely controlled the circulation. An incision, eleven inches long, was made between the interlocking stitches and the cicatrix, embracing the latter and conforming to it, and a flap including the pericranium was rapidly turned up. At the site of the former trephining adhesions existed, and vascular fibrous processes, extending in some places between the bones, and through the central trephine-pin openings in the buttons. These had solidly, and for the most part by bony process, united to the skull forming a firm protection to the brain. The numerous small fragments of bone, chips, etc., had all been absorbed with the exception of three pieces, about the size of barley corns, which were burnished and also rapidly being absorbed, evidently only playing the part of aseptic foreign bodies, and located in the quadrangular space bounded by the four buttons. They are shown in Fig. 3 below the larger portion of bone.

By means of a Hey's saw, an area one and three-quarters by two inches was marked out, embracing the former skull opening, and, with

the same instrument, freed from the surrounding bone. In order to lift it out it was necessary to chisel away one corner, when with an elevator it was removed almost in one piece. It is accurately represented in Fig. 3. Upon the surface of the normally pulsating dura the outline of the buttons and the interstices was clearly marked by fibrous scar tissue, which was neatly dissected off before proceeding.

FIG. 3.



Two-thirds actual size. Section of skull removed at second operation, showing union of trephine buttons and below the three small fragments found in the central space which were undergoing absorption. On the margin of the left lower button another small chip is firmly united. The union between the buttons and the cranial margin is apparently bony.

The dura was next opened and cared for with the precautions formerly employed and above described, displaying the turgid, dark-red convolutions, not adherent to the dural cicatrix or apparently injured by former manipulation. A tolerably strong faradic current was applied to various portions of the uncovered brain through two pointed and sterilized electrodes, but produced no peripheral movements whatever. This suggests the probability that the restoration of motility in the left hand after the paresis following the first operation was brought about by the vicarious action of the left brain arm-centres. As before, the inside of the skull and dura mater and the surface of the convolutions was explored with the finger as far as could be reached in all directions without encountering adhesions or anything abnormal. The brain now seemed to fill the cranium properly, and there was no excess of fluid. The wound was closed in the same manner as after the first operation, except that the bone was not replaced.

Referring, again, to the valuable specimen thus obtained, (Fig. 3), it teaches the old lesson that close apposition is desirable for bony union, and that, other things being equal, a large section of bone stands a better chance of surviving and being again united to the cranium than smaller and loosely applied fragments. It would probably be well to fix the portions of bone replaced by pins of bone or ivory, or by nailing. Possibly when a saw is used, by bevelling the cut proper apposition may be secured.

The patient rallied promptly from the chloroform and presented no indications of shock or paralysis. Convalescence from the operation was unmarked by any notable physical or surgical features. On the 28th there was an evening temperature of 101° F., but it fell the next day and remained thereafter within a small fraction of the normal point. The head was at first dressed daily and later at longer intervals. The drainage was gradually lessened and the wound united by first intention, no pus being seen.

April 3. She sat up and wrote a few words to her father quite coherently. This is the ninth day after the operation.

5th. She was up and around, her mental condition showing improvement.

On the 9th of April she manifested, when questioned by Dr. Church, a considerable degree of memory, intelligence, and appreciation of her condition and surroundings. She showed natural emotion when told of a slight illness which prevented her father's promised visit and read a short letter from him without difficulty and with appreciation. She was anxious to return to her home. She made all her wants known and waited upon herself intelligently, going to the closet as necessary, and presented a great contrast to the condition which had been manifest before the operation.

FIG. 4.



From a photograph taken twenty-three days after the second operation, showing the lines of both incisions and the drainage openings of the latter with the central depression marking the opening in the skull.

16th. Fig. 4 shows the condition of the scalp and skull upon this date, a slight depression appearing at the cranial opening which showed the pulsations of the brain.

19th. The father writes the following:

"I have this day visited my daughter May. She at once recognized me, kissed me, inquired about my recent illness, was affected to tears,

talked quite rationally, asked after particular individuals at home, said she wanted to go home and would like to go at once. I think, making allowance for the small opportunity of judging which I have had, that she now presents a more hopeful and better condition than at a corresponding interval after the first operation."

24th. Is still improving and can now be trusted to do little tasks and to run errands about the hospital. At times she mutters a little, but expresses herself as feeling very well, without pain or discomfort. She is very neat and orderly. What the ultimate result of this operation will be can only be surmised, but the present improvement is very gratifying to all concerned.

CASE II. *Jacksonian epilepsy. Trephining and removal of branching sarcoma; improvement of all symptoms: relapse from probable recurrence of neoplasm.*—Peter H., æt. thirty-nine; a married German carpenter with four healthy children and no family history of neuroses or personal record of neurotic tendency. He had always been in good health and strength, though exceedingly phlegmatic and sluggish in speech, gait, and mental action. July 12, 1888, while working on a building he suddenly fell forward and remained unconscious for half an hour. After an hour of stuporous sleep he rallied, walked some distance to his home, passed a fair night, and in the morning, feeling as well as usual, returned to his work. At the same hour he again lost consciousness, and presented the same train of symptoms as the day previously.

In falling the first time he is said to have struck his head in the frontal region, but nothing very definite is to be learned about it and no mark was left. From this time forward, about once a week, sometimes at longer intervals sometimes at shorter, he had a convulsion, and one day in August had four. These attacks presented the following features: Invariably the first symptom was pain and spasm in the right index-finger gradually involving the rest of the hand, spreading to the wrist and passing up the arm. The extremity presented a flexed attitude and rapid clonic movement. When the body was reached consciousness was lost, and the patient, if not in the recumbent position, would fall. The clonic movements then became general without a tonic stage, and often would persist as much as fifteen minutes by actual observation. During the clonic phase of the attack the urine would be voided, the tongue bitten, the head retracted, the eyes turned up, and all the extremities would be thrown about equally into movement. A stuporous sleep of about an hour would follow, after which full consciousness was restored until the next attack.

Later on the pain in the hand and fingers became constant and excruciating, preventing sleep, rapidly undermining the patient's strength and causing him to move constantly about seeking relief. His attitude was peculiar, his face expressive of intense suffering, and he continually rubbed and held his right hand with his left. He lost weight and strength and became weakened on the right side. The convulsions recurred at about weekly intervals.

January 25, 1889, he was admitted to St. Elizabeth's Hospital in the service of Dr. Coleman in substantially the condition above indicated. There was neither history nor trace of syphilis. Mentally he was very sluggish and very little beyond "Yes" and "No" could be elicited by questions. When standing, the right hemiplegia was manifested by the trembling knee. The right arm and forearm measured one-half inch

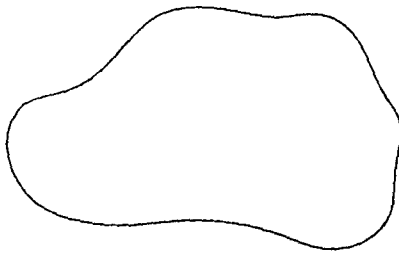
less than the left, and the hand and arm were in constant rigid flexor contraction drawn to and across the body. Any attempts to straighten the limb gave rise to great suffering. Tactile sensation was fairly acute, and there was no sphincteric weakness.

The reflexes, eyes, which were carefully examined by Dr. W. F. Coleman, muscular sense, and urine were normal. He had constant pain in the head, in the frontal region, which, when intense, passed over the vertex to the occiput. Percussion gave rise to a little tenderness on the left side of the head, but nothing distinct. He walked with a broad base as if he had "sea legs on," but his wife said this was natural to him. He presented a very peculiar and tortured picture with his agonized face, his rigid arm, his constant motion to secure relief, the hand enveloped in flannels and liniment or hot applications and carefully supported with the left.

Various plans of treatment were faithfully employed without benefit, and under the impression that the trouble might be peripheral, in the cervical and brachial plexuses, suspension was tried. The first time it caused a convulsion in a few seconds, but afterward was tolerated. From the nature of the convulsions and the general aspect of the case it was ultimately decided that there existed an irritating lesion in the left cortex involving the arm- and particularly the hand-centres, and causing the discharge of those regions manifested in the kinetic display above described. An operation was planned to uncover this area of the cortex and in the absence of demonstrable lesion to excise the faulty centre indicated by the signal symptom—that is, by the initial spasm in the right index-finger, as advised by Horsley. Consequently the patient was prepared for operation as in Case I., and the fissure of Rolando was marked out upon the scalp by a combination of the rules of Reid, Horsley, and Hare. The arm- and hand-centres were carefully delimited.

May 21. Under chloroform, with the assistance of Drs. Luken, Lawson, McCallum, and Kellog, in the presence of Drs. Coleman, Newman, Hall, and others, a flap four inches broad at its base anteriorly and five

FIG. 5.



Outline of opening in skull over left motor region. Reduced one-half.

inches long, including the pericranium, was raised, hemorrhage having first been controlled, as formerly described, by the interlocking stitches. The further technique of the operation did not materially vary from the procedure in Case I. The pulsations of the brain were normal and nothing unusual was found, but just when it had been decided to close the wound, near the anterior margin of the trephine opening a small node on the surface of the convolutions was noticed, differing in color

from the surrounding brain and distinctly firmer to the touch. The cranial aperture was enlarged in this direction, and a thickened cicatricial-appearing mass was found, having the size of a large bean, from which radiated filamentous processes reminding one of a large spider. In order to reach all of it, five buttons of bone were removed with a three-quarter inch trephine and an opening in the skull, the shape and twice the size shown in Fig. 5, made from a tracing taken at the time, was formed with the rongeur. It embraced the middle and lower thirds of the Rolandic fissure, the corresponding portions of the central convolutions and the speech-centre in the third frontal gyre.

The growth was then dissected away as completely as possible, causing the decortication of the brain to a depth of a quarter of an inch over an area larger than a silver dollar, and embraced in the anterior two-thirds of the skull opening. Irrigation was freely employed as in ordinary wounds.

The dura was carefully closed, drainage from the surface of the brain having been provided for by means of a rubber tube filled with iodoform wicking, and the buttons of bone and all fragments, however minute, were replaced, being, as in Case I., supported and drained by meshes of wicking which followed the other drainage out of the dependent part of the wound. A drainage tube also passed under the flap across the field of operation, and the scalp was closed by interrupted sutures. The usual ample gauze dressing was employed. The operation lasted two and a half hours, but was not attended by shock or notable depression.

The following condensed notes were made by the interne, Dr. McCollum, now of Oakland, California.

May 22. Day after operation. Passed a quiet night. The face is drawn to the left. Right hand paralyzed and right side paretic. Sensation is fairly acute. Cannot form words in reply to questions, but repeats words after hearing them. Tongue protruded with difficulty and to the right. Pain has left the right hand. Toward evening the dressing was changed, being soaked with a large quantity of sanguinolent fluid. The anterior portion of skull opening pulsates; the posterior portion is fairly firm to the touch. Patient sat up and drank a little milk, but is liable to lose it from the right corner of the mouth. Temperature, 7 A.M. $97\frac{2}{3}^{\circ}$, at 9 P.M. $100\frac{2}{3}^{\circ}$.

23d. Rather restless. No control of bladder and rectum. Motion on right side improving. A little twitching at times on right side of face. Drainage-tube shortened one-half inch. The scalp is œdematous. No pain. Temperature, 7 A.M. 98° , 9 P.M. 100° .

24th. Slight improvement in motion of right lower extremity. Has a little pain in right hand, which is partly flexed again. Articulation improving. Temperature, $98\frac{2}{3}^{\circ}$ to $99\frac{2}{3}^{\circ}$.

25th. Stationary.

26th. Dressing changed. The œdema of scalp is gone. Half the stitches were removed. Pulsations are less marked. Most of the wicking was withdrawn. Temperature normal.

28th. Improvement in speech. Dressing changed. All drainage removed and the remaining stitches, which produced some twitching in

the right arm. With closed eyes cannot locate a pin-prick on right side, but feels it promptly and keenly.

30th. A little suppuration in lower angle of wound. Introduced a few strands of iodoform wicking for drainage after removing a couple of stitches which had been overlooked.

31st. Restless during the day and toward evening stuporous and hard to rouse. No control of sphincters since operation. Hand and face on right side quivered a little to-day.

June 1. Brighter. Bowels have acted under saline. Temperature normal.

15th. Steady improvement in all particulars. Muscles react to faradism and less strongly to galvanism. There is a tendency to flexor contraction of right hand and arm, which can be overcome only with difficulty, but without pain. At various times this extremity has presented marked twitching. From the wound there is still a little discharge and several small pieces of bone have come away. Has rather better control of his bladder. Sits up an hour or two each day, and enjoys his pipe, which shows a fair control of facial muscle, and no longer lets fluids run out of the right corner of his mouth.

18th. The dressing showed considerable discharge and some dead bone. There is considerable œdema. Patient weaker. Temperature 100°; pulse 92.

19th. Patient losing ground. Temperature 100½°; pulse 100. A few drops of pus on dressing. Had a slight chill during the day.

The face was drawn more to the side, fluids again escaped from the corner of the mouth, speech was impossible, the motor power of the right arm and leg had disappeared, the facial expression was anxious. These symptoms, with the chill, rise of temperature, and slight amount of pus found on the dressings pointed to the formation of an accumulation of pus within the cranium and in the field of the former operation. It was decided to open the skull again and explore the brain without delay.

SECOND OPERATION.—June 20, 1889. Under chloroform an incision four inches long was made through the united flap longitudinally and over the long diameter of the skull opening, laying bare the field of the former operation. Two of the trephine buttons were found tilted up and making pressure upon the brain. All the trephine and other fragments were removed except one button at the highest part of the opening which was allowed to remain, as it looked partially healthy and gave promise of uniting to the cranium. Some of the fragments presented a condition indicative of vitality, while others were bleached white, and evidently either to be cast off or encysted. Through a minute opening in the dura, so small as to prevent drainage, and not admitting a fine probe, a drop of pus could be expressed. An incision opened into a cavity containing about an ounce and a half of thick, cheesy, odorless pus, and was first explored with a narrow forceps, and then with the finger, which was introduced its length, two and three-quarters inches, in the direction of the body of the sphenoid, but whether the ventricles were invaded or not could not be determined. Careful search was made in all directions with the finger to determine the presence of any other accumulation without result. The cavity was freely irrigated. Considerable cerebral fluid escaped during the manipulation. A drainage-tube seven-eighths of an inch in circumference was introduced to the bottom of the cavity, requiring four inches of length to reach to the bottom.

The scalp-wound was duly closed, and the head dressed as formerly. The temperature immediately fell, and at 1 P.M. was $99\frac{1}{2}^{\circ}$; the operation being done by 9 A.M. Toward evening the patient was much brighter, and ate a light supper.

21st. Bowels moved in bed during the night. His voice is stronger and he articulates "Yes" and "No" much louder and more distinctly. Temperature $99\frac{1}{2}^{\circ}$. Right side completely paralyzed.

22d. Complains of pain in the head and face. Can use the bed urinal, but soils the bed with bowel movement. Temperature $98\frac{2}{3}^{\circ}$.

23d. No change.

24th. No voluntary movement. Improving articulation. Drainage-tube taken out and replaced. It contained a little fluid, some pearly bodies, and a few membranous shreds, but had attached to its extremity a tubular glistening sac about three inches long, evidently the lining of the old pus cavity. Examination shows this to be made up of fibrous material of a very firm and rigid sort, staining but poorly, and looking almost chitinous under the microscope. It presents no nerve elements.

FIG. 6.



From untouched photograph showing cicatricial lines of incision for first and second operations, and pulsating depression at site of cranial opening.

25th. Temperature normal.

26th. Temperature normal. Mentally improving.

27th. Head dressed and drainage-tube shortened a half inch. Remaining stitches removed.

July 4. There has been steady and uninterrupted improvement in speech. He can flex the right hand a little. Complains of a little pain

in frontal region. A counter-opening was made under the scalp, and some wicking drawn through to favor better drainage.

7th. Walked half-way across room. Temperature always normal.

10th. Motion is returning in hand and arm. Shows slight movement in fingers, thumb, wrist, and elbow.

17th. Walks with very slight dragging of right leg. A little pain in right arm. Reflexes equal and normal. Movements all improving.

August 15. Steady improvement in all particulars. He has fair control of right hand and side. Free from pain and convulsions.

September 7. Three and a half months after operation. Had an epileptic attack last night.

The condition of the head and scalp is shown in Fig. 6, from an untouched photograph.

Examination of the growth removed at the first operation determined it to be sarcomatous, and its wide ramifications had doubtless precluded its entire excision. The convulsions returned after the last date in a generalized form marked no longer by localizing symptoms, but usually the patient had a feeling that he was to have an attack, and could prepare for it. It was probable that the neoplasm had recurred, and was of wider extent and distribution, in view of which further operative interference was deemed inadvisable.

The patient is still living, and in a fair degree of physical health, subject to convulsions about once in ten days. He has had some return of the pain, variously distributed, and comparatively light in character. There is but a very slight paresis of the right hand and arm. However, his condition even now is much better and more endurable than before the surgical interference, which undoubtedly secured him great relief from pain, and a couple of months of comparative health, with complete freedom from convulsions. The nature of the lesion alone seems to have prevented a complete cure.

CASE III. *Idiocy with generalized and continuous choreoid movements of seven years' duration. Trephining over motor zones; complete cessation of movements without paralysis; death on third day.*—Barney F., eight years of age, was born in Germany of healthy parentage. There is no history of family neurotic taint, and four younger children, brothers and sisters, are in perfect health. The mother insists that she carried him a year *in utero*, but the birth was not unusually difficult and without instrumentation. He appeared in all respects as other infants until the age of three months, when he was one day found with pale face, blue lips, eyes rolled up under lids, and unconscious. He was restored with difficulty in half an hour. The parents thought the infant had been accidentally smothered with pillows thrown on him by other children, but of this there is no surety. At the age of one year he made a crying or calling noise in the night, and was again found in a similar state, lasting a considerable time. From that date he showed choreic movements without interruption. He has never talked, and the use of hands, arms, and legs is very imperfect, as is his control of bladder and rectum. The gait is peculiar, the weight being carried on the toes unsteadily owing to the choreic contortions, and when standing he usually is bent forward with his hands between his knees, like one suffering with cold, his face meanwhile grimacing and his mouth in motion like an animal taking the teat. He gnaws his fingers, pulls at his ears, and when undressed constantly toys with his penis. At times he will rub

the back of his head for a quarter of an hour continuously. He can only articulate the one word "ma," and attempts no response or recognition on being spoken to, though hearing and sight are fairly acute. He manifests likes and dislikes in regard to his food, and has some faint idea of right and wrong, or at least knows when to expect punishment. His mother and brothers and sisters he recognizes at once from other people, and manifests some affection for them, but his intelligence is very feeble. The face, trunk, extremities, and eyes are in constant choreic action during the waking hours, but when asleep there is complete freedom from such movement. At times he is noisy, making peculiar animal-like grunts and bellowing sounds. Physically the health is fair. The head is much contracted anteriorly, as is not unusual in such mental states. (Fig. 7.)

FIG. 7.



Showing characteristic attitude and grimace in Case III.

In substantially this condition he was admitted to St. Elizabeth's Hospital July 15, 1889, in the service of Dr. Frank, his parents clamoring for an operation on the brain, having learned of the case of May M., who at that time was presenting great improvement. The gravity of the matter was fully explained to them, and its experimental nature as well as the lack of indications of localizable lesions. It was clearly pointed out that the operation would be exploratory, and probably would result in finding nothing. Finally, upon the continued solicitation of the family, and with the advice of Dr. Luken, attending physician, it was decided to explore the brain. The head was accordingly prepared for the operation in the manner already indicated.

July 19, 1889. Chloroform was used. Dr. Frank operated, assisted by Dr. Luken and the hospital staff.

First, on the left side three buttons of bone were removed, one with a trephine one and a quarter inch in diameter, the others with a three-quarter inch instrument, making an opening about one and a half by two inches. Nothing unusual was found but the dura, which was fully twice an ordinary thickness. A similar opening was also made on the right side, but a little smaller, and through these the inside of the skull, of the dura, and the surface of the brain were thoroughly investigated. The dura was equally thick on the right side. A little of the brain tissue, thirty-two grains in all, was removed from the motor cortex on both sides, and mainly from the ascending gyres. The wounds were then closed, drained, and dressed as already described in the preceding cases.

The patient recovered promptly from the operation, and twenty minutes after being put to bed made voluntary movements with all his extremities except the right arm. Toward evening he was restless, and received hypodermically one-sixteenth of a grain of morphine, which was repeated at midnight. *Free from choreic movements.*

20th. 7 A. M. Had a fair night. Has good use of all his limbs. The reflexes are intact. Swallows liquids put in his mouth. Temperature 101° F.

8 P. M. The dressing is soaked through, and when changed gave rise to considerable vigorous struggling. Patient would look up when called by name. Temperature $99\frac{1}{2}^{\circ}$.

Midnight. Temperature $100\frac{2}{5}^{\circ}$. Pulse strong, full, and easily counted.

FIG. 8.



Portion of thickened dura with adherent bone buttons removed post-mortem. A few strands of iodoform wicking are attached. One-half actual size.

21st. Passed a quiet day. He can use his legs better than his arms, which he moves but seldom. Temperature, at 7 A. M. $99\frac{2}{5}^{\circ}$, at 7 P. M. $101\frac{3}{10}^{\circ}$. At this later hour he is stuporous and hard to rouse. He swallows readily, and grunts in his peculiar way a good deal. 9.30 P. M. Dressing changed, as it was saturated with fluid from within

the skull, the scalp wound being quite dry, and mainly from the right side. *No choreic movements.*

22d. 7 A.M. Rested quietly. About 2 A.M. showed some difficulty in swallowing. Temperature $100\frac{2}{3}^{\circ}$; pulse 150, and very small. Cannot swallow. Lies perfectly still. Reflexes abolished. Died at 8.40 A.M.

The *post-mortem* examination, made very hastily, as it was objected to by the parents and went no further than the skull, showed the parts to be all healing by first intention, and very nicely. The buttens of bone in this short time were already firmly adherent to the dura, and two of them so attached are shown in Fig. 8, from a recently made photograph of the alcoholic specimen. There was a disintegrating small clot at the site of the subdural drainage-tube, and a small area of brain substance broken down at the same point. About the brain there was nothing abnormal; the dura was uniformly and everywhere greatly thickened.

CASE IV. *Fracture of the skull. Subdural hemorrhage localized. Trephining and removal of clots with relief of symptoms; death due to intra-abdominal hemorrhage from ruptured liver.*—Mary K., æt. twenty-three, an unmarried Bohemian servant-girl, was admitted to St. Elizabeth's Hospital November 21, 1889, in a comatose condition, and assigned to the service of Dr. Frank. During the summer she had suffered continuously with articular rheumatism. In the previous five weeks there had been a severe exacerbation, from which she was just convalescing. A few days before the accident which led to her admission she had manifested a complete change of disposition, becoming quarrelsome, depressed, and fault-finding, instead of cheerful and contented, as was her natural wont. She was emotional and despondent. About noon on the above date, shortly after going to the closet, she jumped from a third-story window, evidently with suicidal intent, and struck upon a wooden pavement, but just how she came in contact with the ground could not be ascertained. She was picked up insensible, and brought directly to the hospital. Deep coma and stertorous breathing were present. Blood oozed from the left ear and nostril, and there was a slight contusion of the scalp over the right parietal eminence. The left pupil was widely dilated and immovable. There was no recognition of, or reaction to, painful sensations. The left arm was completely paralyzed and relaxed, the left lower extremity less so. The right side showed a little resistance to passive movements. Five ribs, from the fifth to the ninth inclusive, on the right side were fractured.

Guided by the bleeding from the left ear and nostril the skull was trephined with a large instrument of an inch and a quarter diameter, through the squamous portion of the left temporal bone, which showed a stellate fracture. The dura bulged without pulsating very firmly into the opening and felt very tense. When a slight opening was made in it there was an alarming spurt of bloody fluid which streamed out as under great pressure to a distance of three or four feet, probably as much as six ounces so escaping. The meningeal artery was tied and the dura raised as in the preceding cases. A few insignificant clots were found and a little oozing of blood from the brain surface. The skull was explored in all directions with the finger within the dura, and as far as possible between the dura and the bone, but no inequalities were palpable. The operation was commenced without an anæsthetic, but in placing the interlocking stitches some pain was occasioned and the

patient freely moved the right extremities, but never made any movements on the left side. Chloroform was used to produce anæsthesia.

The left hemiparesis persisting after the above-mentioned procedure, it was determined to open the right side of the skull over the motor area. A director passed through a small incision in the contused scalp and carefully swept around on the surface of the skull finally detected a fracture, without depression or displacement, near the parietal eminence. In the usual manner the skull was trephined at this point and the tense bulging dura exposed. There was considerable bleeding from the bone which was readily and instantly controlled by means of the pins of decalcified bone, shown in Fig. 9, devised for this purpose by Dr. Frank

FIG. 9.



Pin of decalcified bone to control hemorrhage in bone operations.
Two-thirds actual size.

and manufactured by Schorse & Co., of Milwaukee. They have proven of great value in other operations upon osseous structures. On this side even a greater quantity of fluid similarly escaped. The amount so evacuated was not measured, but must have been altogether at least twelve ounces.

After free drainage had been secured on the left side it was difficult to understand the persistence of pressure on the right and the retention of this fluid. The query was raised whether the falx under such circumstances could act in a valvular manner. When the dura was opened large clots were found covering the surface of the brain on its lateral convexity and extending into the posterior cranial fossa on the right side. They were scooped out and much bleeding ensued from the pial circulation, which seemed also to be the source of the clots. By exploring in all directions with the finger the arachnoid was broken down, and this, as in the first case, was followed by cessation of hemorrhage.

The wounds were closed, drained, and dressed as already described. The breathing at once became natural and the patient moved all her extremities freely during the completion of the dressing, and subsequently upon painful stimulation. Complete consciousness was never regained and she gradually sank and died twenty-four hours after the operation.

By *post-mortem* examination the skull was found widely fractured from the right parietal across the vertex to the opposite temporal bone, then through the petrous portion, the roof of the orbit, and the cribriform plate of the ethmoid. A small fragment from the lesser left wing of the sphenoid was completely separated. The operation wounds were dry and aseptic and the cerebrum looked clean and smooth as if it had never been covered with clots and effused fluid. The abdominal cavity was filled with blood from a rupture on the surface of the liver corresponding to the fractured ribs, and to this death can reasonably be attributed.

In these operations a number of practical points were developed. The control of scalp hæmorrhage with the interlocking stitches was very satisfactory, and when black and white silk were alternated the

manœuvre could be quickly and readily executed. The special forceps figured in Fig. 1 also gave great assistance. The use of irrigation on the brain tissue, though not heretofore advised, proved a great help in clearing the field of obscuring blood, and properly employed with a low pressure seems perfectly allowable. It certainly is less severe upon the cerebral structure than sponging. As to drainage, tubing undoubtedly has the disadvantage of being bulky, but the large amount of fluid regularly discharged in such cases requires an adequate means of escape, otherwise pressure will be brought to bear on the dural flap and probably defeat its union by first intention, upon which so much depends. The dressings must be such as to care for this discharge and for the same reason require frequent changing.

When the bone is to be replaced it should be taken out in as few pieces as possible, preferably in a single piece. The return of small fragments and chips as shown in these cases is of doubtful utility. Efforts may profitably be directed to securing the returned bone to the cranium in the most desirable and favorable position for immediate union and the prevention of deformity. Upon this, ultimate success and the bony protection of the encephalon may hinge.

The brain's tolerance of prolonged and vigorous manipulation is forcibly demonstrated, and its recuperative power after injury and regional loss is again made manifest.

CLINICAL RESULTS OF GASTRIC FARADIZATION.¹

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For some years various gastric disorders have been treated by electricity, both the continuous and interrupted currents being employed. Somewhat over two years ago it occurred to me to employ the current from within the stomach, and to this end I contrived an electrode, a description of which was published in *The Medical Record* of November 9, 1889. Clinical reports of my experience with this method of treatment have been promised for some time, but, for various reasons, the fulfilment of the promise has been delayed until the present. For convenience' sake it seems best to speak first of those disorders of digestion which depend upon structural diseases of the stomach, and second of those disorders that are functional in character.

Of the disorders depending upon structural diseases, electricity has

¹ Read before the Fifteenth Annual Meeting of the Alumni Association of the University of Buffalo, Medical Department, 1890

been chiefly employed in the treatment of gastric dilatation and disturbances depending thereon. Of the cases of dilatation of the stomach, those depending upon stenosis of the pylorus or intestine are usually less amenable to treatment of any kind, and I am not aware that I have had special benefit from the use of gastric faradization in these. My experience leads me to believe, however, that the great majority of cases of dilated stomach are unattended by intestinal stenosis, depending rather upon imperfect innervation of the gastric walls, upon the over-distention of the organ with food and drink and also upon the long-continued eating of bulky and coarse articles of diet that are slow of digestion. I am led to this belief from the comparatively large number of cases of this kind which have come under my observation during the past five years, and in this class of cases the use of gastric faradization has been very beneficial. The good results are shown in the lessening of the size of the stomach, in the increased power of motion during digestion, in the ability of the stomach to empty itself, in the establishment of proper gastric secretion, and in an increased absorptive power.

This will be best illustrated by the following case :

Mr. K., of German parentage, aged forty-five years, by profession a merchant, had for several years been the victim of chronic gastric catarrh with dilatation. The disturbance appeared after a period of overwork, business anxiety, and rapid and irregular eating. His habits were otherwise good. He had enjoyed good health previously, save an attack of typhoid fever early in life.

The patient was sent to me two years ago in April by Dr. Park, of this city, and was found to be suffering from loss of appetite, gastric distress, occasional attacks of vomiting, during which articles of food were ejected which had been swallowed two or three days before, also large amounts of mucus. There was always a sense of weight and distress in the epigastrium; his bowels were constipated; urine alkaline, phosphatic, and at times containing crystals of calcium oxalate in abundance. He had lost greatly in flesh, slept but little, was peevish, irritable and melancholy. The treatment established was daily lavage, which relieved his catarrh but not the dilatation. The stomach contained three quarts of fluid by measurement, and its lower border was one and a half inches below the umbilicus. The electrode was now employed, at first daily, subsequently twice a week, in sufficient power to produce a marked contraction of the stomach, after the organ was emptied through the gastric tube.

In this case I employed mostly faradism. For about two weeks I employed the continuous current in sufficient strength to produce redness at the site of the negative pole, which was applied over the spine. It appeared to me that my best results were obtained from faradization, and the treatment was continued for about one month. Two months after beginning treatment the man was discharged well and he has continued so to the present time, his proper digestion having been restored, the

patient sleeping well, having gained in flesh, having returned to his business responsibilities, which work he again enjoys. Beyond the treatment mentioned and care in diet, little other therapeusis was employed.

I could add to this history those of a number of other equally successful cases. I have never been disappointed in the use of the current in dilatation of the stomach, but I have never practised it where I believed intestinal stenosis to be the causative factor.

Let me now call attention to the functional disorders of digestion, which, it would appear, are far more common than those depending upon structural change. Of the functional disorders of digestion, it may be said, there are (1) Motor disorders, (2) Disorders of sensation, (3) Disorders of secretion, and (4) combinations of the foregoing. Such patients are usually neurotic and have been subjected to unusual mental strain or worry, have overtaxed the digestive apparatus in the vain effort to supply an overworked nervous system, and appear before us in the persons of accountants, teachers, active business men, professional men, and the neurasthenic generally. It has always been found a matter of great difficulty to restore the equilibrium of health in these individuals, for the reason that, beside rest, good nutrition is necessary, and, with the gastric disturbance, good nutrition is often impossible. It occasionally happens that rest alone will so restore the general innervation that digestion is improved and the case requires no further attention. But more often, before rest is practicable, relief must be afforded to the stomach distress, which is the all-important matter in the patient's mind.

To follow the classification above made, attention is first invited to the disorders of motion. These are usually accompanied by other gastric disturbances, but occur occasionally as pure motor affections characterized either by excessive activity of the stomach walls during digestion or a lack of such activity; occur as too early relaxation of the pylorus, or too late; occur as a relaxation of the cardia, which results, during the churning motion of the stomach, in regurgitation of food, gas or both, not necessarily in the form of vomiting, but constituting what we describe as repeating.

A very unusual case of this sort was that which came under my notice through the politeness of Dr. Maus, of the U. S. Army.

It was that of a young woman of American parentage, about twenty-five years old, who had enjoyed good health until some eight years before my examination. Her trouble showed itself in the regurgitation of food coming on almost immediately after eating, mouthful after mouthful being discharged until her stomach was empty. The disturbance increased in intensity until, from the very rapid emptying of the stomach, it had the appearance of vomiting, which, in fact, it was not.

The act itself reminded one of the regurgitation practised by ruminants. The digestion was otherwise not disturbed. There was no unnatural fermentation, the food returned had not an unpleasant taste and the digestion seemed to have progressed as far as was possible in the time that had elapsed since ingestion.

All manner of treatment had been applied. The lady had consulted physicians in many of our important cities, and she had been prescribed for by a number of distinguished men. Nothing had afforded relief. Dr. Maus very kindly carried out my suggestions as to treatment, which were that, before eating, the stomach should be irrigated and gastric faradization practised for fifteen minutes daily. He, of his own accord, also placed the patient in bed for an hour after each meal. The treatment was soon followed by benefit, the regurgitation came on later and the discharges were less frequent and in smaller quantity. The patient began to improve in flesh, having previously been much emaciated. After two weeks' treatment, she was able to retain a meal of moderate proportions without regurgitation. Four weeks later she discontinued the treatment and considered herself practically well. This case was of such unusual interest and showed such unmistakable benefit from the use of the faradic current that I feel confident of the influence of gastric faradization on motor disturbances.

I have had equally good results in the treatment of those cases in which the stomach too early empties itself through pyloric relaxation, resulting in intestinal indigestion accompanied by lenteric discharges; also in cases of a mixed type, of which I have spoken above, in which there is a sensation of motion in the stomach accompanied with borborygmus and pyrosis.

The treatment as applied to those cases in which there is disturbed sensation, and especially gastralgia, may be illustrated by the following case:

Mrs. G., a very neurotic woman, about thirty, who had suffered for several months from indigestion accompanied by pain, sometimes very intense, lasting for hours. No remedy short of an anodyne had been found equal to its relief. Gastric faradization was followed by cessation of the pain after half a dozen sittings, not to recur again. Meantime and thereafter, the patient's general health was improved by systemic treatment.

Such cases are common enough and they have generally been promptly relieved by this form of treatment. The same experience has been had by professional friends who have practised this method.

Now as to the third class of cases, or those depending upon a disturbed secretion: the most important, to my mind, are those wherein there is excessive secretion of hydrochloric acid, which is continuously present, and, when the stomach is empty, gives rise to gastralgia and pyrosis, sleeplessness, melancholy, and loss of flesh. These cases are much more common, it appears to me, than is generally supposed, and they seem to be steadily on the increase. It is not always necessary to resort to fara-

dization for their relief, and, when possible, I have avoided this somewhat troublesome procedure, but when practised it has been of undoubted service, which was particularly shown in the following case:

A young physician of this city was prostrated one night by a hœmatemesis. This experience was a great surprise to him as he considered himself in good health and had not suffered especially from his stomach. It was believed that he was the victim of round ulcer, and he was treated accordingly. As soon as practicable, the gastric contents were examined, when an enormous amount of hydrochloric acid was found present at all times. Efforts to overcome this by the administration of alkalis were unavailing. A large amount of gas would be discharged, a momentary relief experienced, but soon after hydrochloric acid was found present in its usual abundance. A strict albuminoid diet was established, gastric sedatives of various kinds prescribed, the eating of ice was allowed as an experiment, the drinking of hot water was tried, but none of our efforts gave relief. The stomach after being thoroughly irrigated showed in a short time hydrochloric acid as usual. This was demonstrated not only by the intensity of color in the phloro-glucin vanillin test but by the quantitative examination suggested some time ago by Dr. Kinnicutt, of New York. This method of examination my patient carried out for himself very carefully, and he determined that none of the remedies lessened the acid.

At this time gastric faradization was begun and continued regularly—if I remember correctly, daily—for about three weeks, and coincident with this he began to improve, and while he did not demonstrate by daily examination that hydrochloric acid was steadily decreasing, he felt satisfied of this by the disappearance of symptoms which doubtless had depended upon its presence. The improvement was continuous and the patient was soon restored to health.

This case was a phenomenal one in the intensity of its early symptoms, the great abundance of hydrochloric acid, and its obstinate resistance to treatment, and, to my mind, equally remarkable was the relief which apparently followed the use of gastric faradization.

I can report no other case of equal severity, but I could mention a number of others which have shown rapid diminution of hydrochloric acid under treatment by gastric faradization—for instance, that of Mr. D., a young business man, aged thirty, suffering from neurasthenia with acute indigestion and excess of hydrochloric acid, relieved by lavage before his six-o'clock dinner, and the employment of faradization for a period of not over two weeks. In his case, the trouble recurred and he was subsequently treated without faradization, and he improved, but not as rapidly as when faradization was practised.

I might also mention the case of Mrs. F., a young mother who, after lactation, suffered from gastralgia and pyrosis, which were relieved by an albuminoid diet supplemented by faradization, the most marked improvement being under faradization.

In these cases I have found it expedient to direct frequent small meals

of albuminoids, and between these I am in the habit of administering gastric sedatives. Exactly what rôle is played by faradization I am unable to state; whether it is a gastric sedative or a gastric stimulant, I do not know. My efforts were in the direction of study and the results were so favorable that I applied faradism to cases seemingly contradictory in character and I have concluded that the great variety of gastric neuroses depend upon a common cause—an imperfect innervation of the stomach; that electricity improves this innervation, thereby relieving the cause and so the conditions which, at first thought, are so contradictory.

I may add, by the way, that this last class of cases, in which there is an excess of hydrochloric acid secretion, is far more common than any other variety of functional disturbance; that these cases are greatly improved by the albuminoid diet there can be no doubt. A diet of starch seems especially disturbing, a fact which was something of a puzzle to me until my colleague, Prof. Pohlman, informed me that he found in dogs that cooked starch was almost entirely absorbed from the stomach without passing into the duodenum; that although in the dog's stomach hydrochloric acid is in greater proportion than in man's, if it appeared in excess the digestion of starch in the stomach was hindered; and, if the acid was in great excess, absolutely prevented.

I had supposed that the action of ptyalin upon starch ceased in an acid medium, and that, therefore, starch digestion was quite uniformly interrupted in the stomach; but Prof. Pohlman assures me that the contrary is the case, that the digestion of starch is not interrupted in the stomach save when the gastric juice has hydrochloric acid in great excess.

With this light it is easy to understand how a reduction of the hydrochloric acid will improve the digestion of starches and it is a clinical fact that when relief from acid is obtained by faradization, or other means, the digestion of starches is made more easy and the patient is able to return to a mixed diet.

I do not claim for gastric faradization the cure of every ail the stomach is heir to, but that it is a useful measure and one that succeeds in difficult cases when ordinary methods are attended with poor results.

The question naturally arises, What is the effect of gastric faradization as compared with that of the application of the continuous current? While I have devoted some time to the study of the continuous current, I do not feel prepared to offer positive views concerning its special applicability, or the comparative merits of the two currents in these diseases. That there is a wide field for the special effects of the continuous current employed in this way, I have no doubt. It would appear that we could possibly promote or retard the secretion of acid at pleasure; that we might improve the innervation of the stomach, that we might contract

the stomach walls when the faradic current in ordinary strength is ineffectual, but on these questions I do not feel like speaking authoritatively. However, I assume quite another attitude on the subject of faradization; I am even complaisant under the incredulous smiles of my professional friends. Let someone deny its usefulness who has tried it.

ON FALSE PREGNANCY.

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IN the course of long obstetric experience a considerable number of cases of false pregnancy have come within my observation. In some of these the patient had been previously under medical treatment without recognition of the true nature of her condition; and in others its investigation ultimately became the subject of legal inquiry and elicited very divergent opinions from the several experts examined. In one remarkable instance of this kind I was called on to disprove the physical possibility of maternity in the case of a lady who had pretended to give birth to a child, which having been accepted as his own by the alleged father, was, after his death, on legal investigation deprived of the inheritance thus acquired. In consideration, therefore, of the comparative frequency of cases in which symptoms of pregnancy may be simulated by disease, and the possibility of their being counterfeited by design, as well as their clinical interest and occasional medico-legal importance, some observations on this subject to which, many years ago, I first directed attention in the *Transactions* of the former *Dublin Obstetrical Society*, may not be devoid of practical utility.

Under the heading of the present communication two conditions of a distinct character are included, viz.: First, cases in which symptoms dependent on disease may give rise to unfounded belief in the existence of pregnancy; and secondly, the less frequently met with class of cases in which symptoms of gestation are decidedly counterfeited. With regard to the former, it may, and indeed often does occur, as was well observed by Dr. Montgomery,

"that a woman with an enlarged belly arising from some purely accidental or morbid cause, becomes an object of suspicion, and afterward the sudden reduction of her size may, however, unjustly affix upon her the imputation of clandestine delivery; and although such charge may never be made the subject of a legal or criminal investigation, its influences would be alike unjustly prejudicial to the character of the individual and injurious to the moral interests of society."

Such cases are, however, fortunately of less common occurrence than those in which pseudocyesis is not the occasion of reproach, but rather,

for a brief period at least, a matter of congratulation for its subject. This occurs in nine cases out of every ten of the kind in childless women desirous of offspring, and in exemplification of the old adage, "The wish is father to the thought."

In this way it happens that spurious pregnancy is as often psychological as physical in its origin, and in either case is no less commonly met with in hospital practice amongst the poorer classes than it is in those belonging to the wealthier ranks of society, whose idle, overfed, sterile matrons are supposed by some to be its only victims. In both classes, however, it is most commonly met with in previously sterile women at about the period of the menopause, although in some exceptional cases I have observed it in pluriparæ, and at a very early age.

Where this condition is thus psychological, its recognition is comparatively easy, but its management is more difficult than in those cases presently to be referred to, where it results from physical disease. Nor do I know any duty more thankless and unpleasant than that of the consultant when obliged, as I have too frequently been compelled, to disillusion a patient who, having persuaded herself and those about her that at last she has become pregnant, has made the usual preparations for the expected event, and ultimately is, by some anomalous abdominal pain, deceived into fancying herself in labor, and under that impression sends in haste for medical assistance. In such a case I have more than once been called in consultation to the aid of a young practitioner, who unfortunately allowed himself as well as his patient, to imagine not merely that she was pregnant, but actually in labor; and I have sometimes found it no easy matter to smooth over the trouble in which both patient and doctor were involved, and to prevent the latter being (and perhaps not undeservedly) made the scape-goat for all the vexation of which a woman's wounded pride may be conceived capable under such circumstances.

The possibility of pseudocyesis should, therefore, never be lost sight of in accepting an obstetric engagement; nor should one ever be booked down as a mere matter of routine and without sufficient inquiry to prevent such an untoward mistake, than which few errors of judgment might be more prejudicial to a practitioner. In many instances the diagnosis is by no means facile, especially in the case of patients who have borne children and hence are conversant with the symptoms of the condition which they desiderate, and to which they have persuaded themselves they have again attained. Nor is it less difficult when our would-be clients are sterile, *passé* married women craving for offspring, that, having familiarized their minds with everything relating to this subject, have become monomaniacs thereon, and who oftentimes succeed in deceiving others as well as themselves.

In this way, and more particularly when dealing with women approach-

ing the menopause, we may have presented not only the Protean nervous and sympathetic disturbances supposed to indicate pregnancy, but also many of its common symptoms, such as morning sickness following suppression of menstruation, enlargement of the mammae and areolar papillae, or even the secretion of a lactescent fluid, which I have seen triumphantly expressed in proof of her supposed approaching maternity by a patient whose uterus was void of any foetal tenant. If at the same time the abdomen, whether from mere obesity or flatus, the rumblings of which are insisted on as evidences of the movements of the imaginary foetus, or from any more tangible morbid condition becomes gradually increased in bulk (though in such cases this increase is nearly always much more rapid than occurs at the corresponding period of normal gestation), then heaven help the practitioner who ventures to suggest a doubt as to the nature of the case!

The causes of pseudocyesis are indeed Protean in their variety and complexity, and oftentimes manifest themselves in such a form as to give rise to no little difficulty in their differential diagnosis. Thus, in addition to those already alluded to, namely, change of life, hysteria, and obesity, the existence of pregnancy may be counterfeited by various intra-peritoneal morbid conditions, including, amongst many others, ascites, ovarian, tubal, and uterine tumors, physometra, hæmatometra, etc.

The most important, however, of the conditions by which a woman not quick with child may be led to indulge in the delusive anticipation of maternity, is the so-called molar pregnancy, in either of its two well-known forms, viz., the *mola sanguinosa*, or else the *vesicular*, or as it was formerly termed, the hydatidiform mole. The latter is by far the most practically interesting in this connection of all these, as it is that most frequently met with. Having, however, elsewhere fully discussed the pathology of this condition, I need not here enlarge on it beyond observing that its presence is dependent on myxomatous proliferation in the placental chorionic villi of a disintegrated ovum; although it may be added that in some exceptional instances very similar-looking growths have been found *in utero* under circumstances which precluded the possibility of impregnation.

In all the instances of this kind that I have met, with only two exceptions, the patients, whilst suffering from myxoma of the placental chorionic villi of a blighted ovum, still supposed themselves carrying a living child, the imaginary movements of which they insisted they were conscious of, until ultimately undeceived by the expulsion of the vesicular growth, which generally occurs at about the fifth month, when by its bulk uterine irritation and expulsive action are produced. Nor before the fourth month is there any possibility of discriminating with certainty between molar and true pregnancy; but after this period the absence

of the positive signs of gestation should, of course, enable us to determine the question, as these can neither be simulated by disease nor counterfeited by design.

In almost every case of pseudocyesis, however, it may generally be ascertained that there is something unusual in the symptoms: either some essential one is absent, or else the symptoms that belong to one period of pregnancy manifest themselves at another and commonly an earlier time than usual.

Until the fifth month physical examination affords us comparatively little assistance in such cases, and, as a rule, neither patient nor physician ever dreams of the possibility of the case being one of spurious pregnancy at a previous date. From that time the recognition of the sounds of the foetal heart, and, though with less certainty, the placental bruit, under ordinary circumstances affords the obstetric expert the means of discriminating between true pregnancy and pseudocyesis. Nevertheless, I must still confess myself somewhat sceptical with regard to the value of the information thus obtained by some practitioners as a test between these conditions. Even in the last month of pregnancy the non-distinguishability by an expert of the foetal heart at the moment of examination is, *per se*, no absolute proof, as I have elsewhere shown, that the uterus may not then contain a living foetus. How much less reliable, therefore, is this negative evidence when employed, as it often is, at a very early stage in such cases, and perhaps then by those who are not specially expert either as auscultators or as obstetricians. Nor is even the positive proof of pregnancy derivable from the stethoscope by any means as certain as a diagnostic, in the hands of the average medical practitioner, as is commonly regarded. I have myself seen this exemplified even by men of some experience, who had persuaded themselves that they could recognize both the foetal heart-sounds and the placental bruit in cases in which neither existed, and who, on the faith of this supposed evidence of pregnancy, pronounced in haste opinions which were subsequently repented at leisure.

A more generally available test in such cases is that afforded by a properly conducted bimanual or conjoint abdominal and vaginal examination, by which the exact size and position of the uterus may be readily ascertained, as well as the cause of its enlargement in the latter months, though not in the early period of the supposed pregnancy. In those cases of pseudocyesis, in which the patient, being anxious to be thought pregnant, contributes, as is often the case, to the deception by making her abdominal muscles so tense and rigid that it becomes difficult to determine otherwise the condition of the uterus; this may easily be overcome by examination under chloroform.

It would be needless here to dwell on the diagnosis between pregnancy and those morbid conditions by which it may be simulated in cases of

pseudocyesis, as the differentiation between the various uterine, ovarian and tubal, and other intra-peritoneal tumors and diseases should presumably be found in any text-book of gynecology. Nor shall I in this connection occupy space with any reference to the relative importance of the several symptoms and signs of normal pregnancy, inasmuch as I have nothing to add on this point beyond the facts that may be found in my edition of *The Dublin Practice of Midwifery*. And, for similar considerations of economy of time and space I have also eliminated from this paper the history of several remarkable cases of spurious pregnancy which, from time to time, have come under my observation. The scope of the present brief communication precludes such exemplification of the foregoing remarks, or any allusion to other points of interest connected with the subject of pseudocyesis, my chief object now being to call the attention of junior practitioners to the frequency of cases in which the symptoms of pregnancy are either simulated or obscured by disease, as well as to the possibility of this condition being wilfully feigned in some instances.

In conclusion, therefore, I have merely to reiterate, what I am convinced by practical experience to be a much-needed word of warning as to the importance of greater caution than is sometimes exercised in answering, without sufficient knowledge, the often-asked question: "Is the person in whose case we are consulted actually pregnant or not?" On our reply to that apparently simple query may possibly depend the fair name of a girl, or the happiness of a wife, or even the life of a woman condemned to capital punishment, in whose case the plea of pregnancy may be raised in stay of execution. Issues so grave are not to be lightly regarded, or hastily disposed of; and in his decision thereon, as in all other obstetric difficulties, the practitioner's judgment should be arrived at and acted on "*nec temere, nec timide*."

THE DISTOMA SINENSE, A RARE FORM OF THE LIVER FLUKE, WITH REPORT OF A CASE IN WHICH IT WAS FOUND.

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IN October, 1888, in an autopsy at Charity Hospital on the body of a Chinaman, I found a rather small liver, filled with miliary gummata, and showing greatly dilated and thick-walled bile-ducts. In a casual examination there seemed to be no explanation for the dilatation of the

gall-ducts, but on more careful search for the cause, numerous small, flat lanceolate trematode worms were seen projecting here and there from the cut ends of the ducts. These appeared in large numbers with the bile when pressure was applied to the liver. They were recognized as liver flukes, and were afterward identified as a rare species of distoma (the *Distoma Sinense*), which has, I believe, not been observed in this country or Europe, and has only been found in a few cases in the East in China-men.

The history of the case was very defective, as the patient could not speak English and no Chinese interpreter was at hand. So far as could be learned, it was about as follows :

He had been an inmate of the hospital for about five months, and was suffering from a hemiplegia of the spastic type, cause unknown. There was almost complete loss of power in the left arm and leg, accompanied by considerable rigidity and irregular convulsive movements. There was only slight atrophy on this side. There had been from time to time some disturbance of the functions of the alimentary tract, associated with diarrhoea, but nothing that had attracted especial attention. Until a few days before his death he was able to use his right arm and leg, and could feed himself. He was of an exceedingly happy disposition. Two or three days before his death he developed suddenly considerable temperature, with marked pulmonary symptoms. He failed rapidly, and died with symptoms of pulmonary oedema.

The autopsy notes, in brief, were as follows :

Subject somewhat emaciated. The abdominal organs are normal in appearance, but the liver is retracted about one inch above the free border of the ribs. There are a few petechial hemorrhages underneath the surface of the pericardium. The aortic valves show lesions resulting from an old endocarditis, and on both the aortic and mitral valves are numerous vegetations produced by a recent endocarditis. The lower lobe of the right lung contains a small abscess (recent) with consolidation around it, and a spot of gangrene about one and one-fifth inches in diameter. There is also an area of consolidation involving the lower portion of the upper lobe of the left lung, and a recent pleuritis corresponding to the areas of disease in both lungs. That associated with the disease in the right lung has a fibrino-purulent exudation. The spleen is somewhat large and soft. The kidneys show lesions of an old interstitial nephritis. The liver is rather small, and is filled with an enormous number of miliary gummata. The gall-bladder is moderately dilated, and is distended with bile; and the gall-ducts, especially the smaller ones, are greatly dilated and their walls are much thickened. Pressure upon the liver after section of the organ caused the extrusion from the cut ends of the ducts of large numbers of the distoma referred to above. Forty or fifty were collected from a single longitudinal section through the liver after pressure had been applied to the organ. None were found in the gall bladder, but one was found protruding into the duodenum from the opening of the ductus communis choledochus. The stomach and intestines are normal in appearance. The dura mater and pia-arachnoid are adherent to each other for a considerable area on the right side in the motor region of the cortex. Projecting from the

membranes in this region between the fissures of the cortex are seven gummata, varying from two-fifths to three-fifths or four-fifths of an inch in diameter. These are situated directly over the motor cortical area, involving the upper portion of the left anterior and posterior central convolutions, the paracentral lobule, and the superior parietal lobule. Around this area is a quite wide zone of recent gummatous lepto-meningitis.

In the *Lancet* of August 21, 1875, Dr. J. F. P. McConnell, of Calcutta, described a new species of liver-fluke, or distoma, found by him in the dilated gall-ducts of the liver of a Chinaman. In December, 1874, Dr. William MacGregor, of Port Louis, Mauritius, also found the same species of distoma in an autopsy on a Chinaman, and described it independently in the *Glasgow Medical Journal* of May 26, 1877. The nature of these parasites was determined by T. Spencer Cobbold, and they were by him named *Distoma Sinense*. Leuckart afterward suggested the name *Distoma Spatulatum*, but the nomenclature of Cobbold has been retained by most writers on the subject.

In the cases reported by Dr. MacGregor, in which the same parasite was found in the liver as in the case reported by Dr. McConnell, there were some peculiar nervous symptoms. Dr. MacGregor says there was a peculiar form of paralysis, unlike that found in any other disease, and which, he suggests, may be due to some chemical nerve poison, produced by the parasite and then absorbed into the circulation. In the report of these cases, Dr. MacGregor says:

"When I took charge of the hospital at Mauritius there was among the patients a Chinaman who suffered from paralysis—as his diet sheet said, from abuse of opium; examination showed that the symptoms were peculiar, different from any disease generally known here. It could not be ascertained that there was any sufficient reason for supposing that his illness was induced by opium. Within the next six months eight cases of the same disease were admitted to the hospital, three of which died and five were discharged. Autopsies were performed in the fatal cases, and the parasites were always found in large numbers."

The history in these cases, as reported by Dr. MacGregor, was about as follows: In the beginning the legs and feet were somewhat swollen and painful. These symptoms were quickly followed by paralysis of the extremities. The extensor muscles were more affected than the flexors. Wrist-drop was marked. There was decided atrophy in the legs and arms, and paralysis in some of the cases was almost complete. Sensation was not affected, and there was no paralysis in the face, tongue, or sphincter muscles. The sensorium was intact. The pulse was about 110, respiration 24, temperature 99½°. Bowels were constipated. The patient gradually grew weaker, and finally died, with symptoms of oedema of the lungs. This seemed to be the immediate cause of death in each case. The spinal cord, with the roots of the spinal nerves, were removed in the fatal cases and carefully examined, and nothing abnor-

mal was detected in them; and, in the peripheral nerves and muscles, only an incipient fatty degeneration of the muscular fibre could be detected. There were no signs of lead-poisoning.

Dr. McConnell does not refer to these symptoms described by Dr. MacGregor as being present in the case reported by him, and, so far as could be ascertained, they were not present in the one here reported. The rigidity, paralysis, and convulsive movements on the left side were, of course, fully accounted for by the gummata in the motor cortical zone of the opposite side. It seems not improbable that in Dr. MacGregor's cases the parasites were accidental accompaniments of some other disease (perhaps peripheral neuritis, although it is said that no lesions were found in the peripheral nerves); this disease, whatever its nature, being the immediate cause of death.

In my case there seemed to be no evidence that the liver flukes were the cause of death. The patient evidently died of sepsis, as was shown by the history and the post-mortem lesions.

The clinical history in Dr. McConnell's case was very incomplete, as the patient was admitted to the hospital in a comatose condition, with little previous history, and died a few hours after his admission.

The following notes are extracts from Dr. McConnell's report of the autopsy:

"The lung substance was structurally healthy. One ounce of deeply yellow-tinged serum was found in the pericardial cavity; a few dark clots and fluid blood in the right chambers of the heart; the left were almost empty. The peritoneum was healthy. The liver was large, swollen, and tense; superficially of a dark-purple color, on section paler, more dingy, or muddy-looking. Its parenchyma everywhere very soft. The large portal and hepatic veins were filled with fluid blood, and the bile-ducts particularly distinct, from their large size and distention with thick yellow bile. On incising the liver in different directions, it was noticed that small dark, vermicular-looking bodies escaped on the table, and on more careful examination these were clearly seen to protrude from the bile-ducts, which, on being dissected, were found more or less obstructed by and containing them in large numbers; all were dead. The gall-bladder was full; the cystic and common bile-ducts were patent. No distomata were found in the gall-bladder, nor were any ova found on microscopical examination of the bile and the lining membrane of this sac. Numerous ova and shreds of epithelium were found in the biliary canals. (The weight of the liver after incision was fifty-four and a half ounces.) A most remarkable and intense pigmentation of the liver parenchyma was observed in microscopical sections—not mere staining, but a positive infiltration of black pigment, granular in character, and not confined or specially distributed in the inter-lobular tissue, but accompanying the hepatic cells also within the lobules. The pigment matter appeared to be biliary rather than hæmatoid. Many of the hepatic cells were also infiltrated with fat, and the nucleus in the majority was ill-defined, or altogether indistinguishable. The *spleen* was found enlarged; its capsule stretched, slightly thickened, and opaque; its substance very dark and pulpy; weight, thirteen and three-quarters ounces. The kidneys were moderately hyperæmic and dark. The small intestines were found deeply bile-stained; the large intestines were natural. The fecal contents of both, partly solid and partly liquid, were bile-colored, but no distomata were found in them, although carefully washed and examined.

Remarks.—The morbid anatomy of the liver in this case seems unequivocally to point to the pressure of the flukes in its biliary duct as the exciting cause of the acute and extensive structural degeneration of the proper structure of the organ, and of that cholæmic condition induced by the obstruction of the biliary channels, which appears to have been the immediate cause of death.

"It is noticeable that the gall-bladder itself contained no distomata, nor exhibited any evidences of having been occupied by them, while the bile-ducts were found densely crowded. I must have collected at least thirty specimens in my dissection, and numbers doubtless still remained in those portions of the liver which I have preserved entire, for hardly any duct of medium size has not been found to contain two, three, or more of these parasites."

Notwithstanding the conclusion arrived at by Drs. MacGregor and McConnell that death in the cases reported by them was due directly or indirectly to these parasites, it seems to me that a careful consideration of the clinical history and *post-mortem* lesions of their cases and the one here reported forces the conclusion that the parasites and the effect produced by them are incidental and very indirectly, if at all, instrumental in the production of death. The only point in common in all these cases was the presence of the parasites in the dilated bile-ducts. Nothing in the clinical history pointed to their existence, and their presence was only discovered in the ordinary course of examination. In Dr. McConnell's case the liver was large and soft. In Dr. MacGregor's cases and in mine it was small. In all the cases the ducts were dilated. It seems to me probable that the parasites produce little more than occasionally some obstruction of the bile-ducts, with probably icterus and some mild gastro-intestinal disturbance.

The parasites in my case were somewhat larger than those described by Dr. MacGregor, and seem to have been more deeply pigmented. Otherwise they appear to be identical with those described by him, and the following description is in part taken from his paper:

The larger specimens were a little more than four-fifths of an inch in length, by about one-eighth of an inch in width, and were lanceolate in form; the anterior extremity being narrow and the posterior broad and rounded. The color varies somewhat in different individuals, being in some considerably darker than in others. The anterior and posterior extremities and the edges are of a very dark brown or almost black color. The central portion is of a dirty yellow color and has a broad dark band in its anterior half, where the uterine folds are situated. The anterior extremity has a sucker with a cup-shaped depression, which opens into a pouch (œsophageal pouch) that divides into two simple tubes which form the alimentary tract. One of these tubes extends along either side of the worm to the posterior extremity, where it terminates in a blind end. These tubes constitute the stomach and sometimes contain small granular particles. Outside of these tubes, on either side, lie the yolk-glands which occupy about two-thirds of the length of the organism. The

whole of the central portion is occupied by the organs of reproduction. On the ventral surface of the organism, a short distance back of the anterior extremity, is situated the ventral sucker. It consists of a cup-shaped depression with a circular muscular sphincter. There is a water-vascular system, consisting of a branching tube, which commences at the caudal extremity, and passing between the blind extremities of the stomach tubes, dilates a little and then proceeds onward in a slightly crooked course about as far as the junction of the anterior two-thirds with the posterior third of the organism. It then divides into two branches which it is difficult to follow, but apparently one passes to either side to the outer side of the stomach tubes. The contents are small, highly refractive particles.

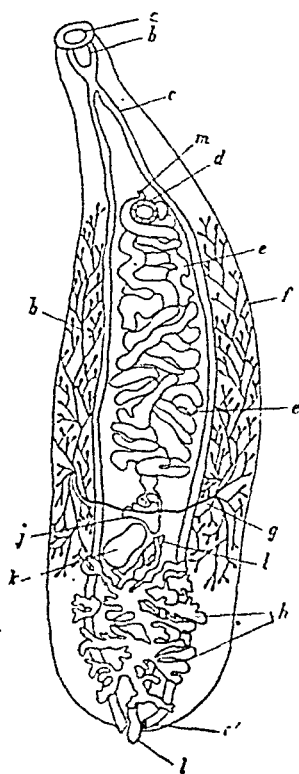
The organs concerned in reproduction occupy the greater part of the animal, and consist of the ovary, uterus and uterine pouch, testes, yolk gland ducts, and yolk-glands. The ovary is a dark, oval-shaped body, lying obliquely with regard to the long axis of the median line, from a little beyond which it extends to the stomach tube. It varies in shape and size according to its contents. Attached to the end next to the oral extremity of the animal is an irregular sacculated pouch; it would appear to contain the miniature eggs until they are sufficiently developed for extrusion into the uterus.

The ducts of the yolk-forming glands proceed straight from the uterine pouch, one to either side of the animal, and spread out into two beautifully formed pods, the yolk-glands. These yolk-glands are situated between the stomach tube and the outer edge of the animal, and extend on both sides as far forward as the ventral sucker, and as far backward as the ovary; their contents are of a dark-brown color, but after being treated for some time with a solution of caustic soda they become of a light-red color.

The uterus is a long, irregularly branched pouch, occupying nearly the whole of the central portion between the gastric tubes, and extends from the ventral sucker in front to the ovaries behind. It has a dark-brown color from the multitude of contained eggs. It opens externally at the genital orifice, just in front of the ventral sucker. The testes are situated in the posterior third of the animal between the stomach tubes. They present a beautiful dendritic appearance that varies in its details in different individuals. It is very difficult to trace the course of the vasa deferentia, but, according to Cobbold, they seem to form a common duct, which serves as an intro-mittant organ. The eggs are very small and are present in enormous numbers. They have a brown color which is due, not to the covering of the egg, but to the granules which it contains; the operculum of the egg is colorless; it is situated at one end and seems to be easily detached, as it is not seen on many eggs even before extrusion from the uterus. The secretions of the ovary, testes, and yolk-glands seem to meet in the uterine pouch and to form, by their union, a fully developed egg, which passes thence into the uterus. The outer covering of the animal is composed of a homogeneous cuticle which is reflected into the interior at the mouth of the genital orifice, and the opening of the secretory canal or water-vascular system. This outer covering presents numerous projections from its surface. Underneath it is a cellular layer and then comes a layer of muscular fibres arranged chiefly in longitudinal bundles.

Regarding the life-history of the common liver-fluke found in sheep and the manner of its entrance into the sheep's body, it seems to be about as follows:

After the escape of the eggs from their host they develop into ciliated embryos which, swimming around in the water, finally fix themselves on the surface of a snail or some similar soft-bodied water animal and bore their way into its interior. Then the embryos become transformed into *sporo-cysts*. In the *sporo-cyst* develops the *redia*, which has a digestive tract and an organ of locomotion. The *redia* escapes from the *sporo-cysts* and makes its way usually to the liver of the snail and there reaches its maturity. In the body of the adult *redia* is developed the *cercaria*. The *cercaria* has a tail for locomotion and by means of this it wiggles out of its host and then swims freely in the water. Finally



× 10.

- | | |
|--|------------------------------|
| a. Oral sucker. | f. Yolk-glands. |
| b. Oesophageal pouch. | g. Ducts of the yolk-glands. |
| c. Intestinal tubes. | h. Testes. |
| c'. Blind extremities of the intestinal tubes. | j. Uterine pouch. |
| d. Ventral sucker. | k. Ovary. |
| e. Uterine folds. | l. Water-vascular system. |
| | m. Genital orifice. |

this fixes itself on the stems or leaves of some water plant and there becomes encysted. In this condition the larvæ are swallowed by the grazing sheep.

The life-history of a typical trematode may then be summed up as follows:

- 1st. The egg produced sexually.
- 2d. The *ciliated embryo*.
- 3d. The *sporo-cyst*, produced asexually.
- 4th. The *redia*, produced asexually.
- 5th. The *cercaria*, produced asexually.
- 6th. The *adult trematode* (Leuckart).

MacGregor, acting on the supposition that the larvæ must have been taken in on some article of food peculiar to the Chinese, examined some specimens of the *bêche de mer*, a favorite article of diet among the Chinese, and found in them forms corresponding to both the *sporo-cysts* and the *cercaria*.

This, then, is a probable explanation of the method of introduction of the larvæ into the human subject.

The accompanying illustration, prepared with great care by my assistant, Mr. Washburn, affords a good representation of the internal structure of this organism.

58 EAST TWENTY-FIFTH STREET, NEW YORK.

AN INVESTIGATION INTO THE ETIOLOGY OF PHTHISIS.

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IV.

ON THE ETIOLOGY AND LOCAL TREATMENT OF PHTHISIS PULMONALIS.

BY E. L. SHURLY, M.D.

FOLLOWING the trend of modern writings and expressions the whole subject of the etiology of phthisis pulmonalis and tuberculosis might be summed up by the statement, that these forms of disease are specific, with a specific cause, viz., the *bacillus tuberculosis*; every other factor being thus either swallowed up or playing a merely subsidiary part. And so dogmatic, not to say extravagant, are these numerous promulgations, that the professional mind generally has been led into this belief as a fact, that the existence of this microorganism really

comprises the whole subject of the etiology of such disease conditions. Be this so or not, it does not seem to fit into the daily clinical observations which a careful comparative study of cases might display. If the observations put forth in a previous paper be at all correct we are forced then to assume that these complex conditions of disease, commonly entitled phthisis pulmonalis, or tuberculosis, differ from each other enough to be considered entities, and cannot be justly grouped together, either clinically or etiologically upon the bacillary theory *alone*. For, there *must* be something else in operation with the bacillus, either previously or subsequently, to produce the varying features. Although the predisposing causes of phthisis pulmonalis and tuberculosis are often, according to ordinary observation, alike, or nearly so; yet, it does not follow that these conditions *are the same*, either pathologically or clinically, any more than that Bright's disease and diabetes, or rheumatic arthritis (when following similar predisponants) are the same disease.

To avoid prolixity we shall not take up the whole range of predisposing and exciting causes abounding in medical literature, but confine our discussion to heredity, contagion, and environment principally, giving an outline only of our therapeutic experiments.

Concerning the importance of "heredity," or "hereditary tendency," as an etiological factor, there seems to be more or less difference of opinion; for, while many seem to believe that its origin and spread are due to a microorganism (bacillus), and its diffusion in the several ways incident to human intercommunication, the more conservative still lay great stress upon the idea of inheritance. All, however, admit that inasmuch as we are all being constantly invaded, so to speak, by the bacillus, that some peculiar condition of the body (immunity) exists to save the majority, while some opposite condition of the body (tendency) exists in the minority to determine the selection.

Of course, the subject of immunity (both acquired and natural) has engaged the thought of the profession for many years, and yet no scientific explanation has been adduced. Likewise the laws and principles of heredity have as yet baffled discovery. Intangible, like the forces chemical affinity and electricity, we know them by their effects only; but, unfortunately, heredity, unlike the former forces, does not operate in the same manner under the same conditions (so far as we are able to judge), and we are, therefore, unable to grasp its results. This will be one of the objects of our investigation when we can succeed (as we hope to) in breeding the higher monkeys in this country. While, therefore, this lack of absolute knowledge regarding the transmission of psychical and physical traits may account for some of the discrepancy of opinion prevailing, yet we ought not to shut our eyes to the observations or the facts (disconnected though they be) concerning the transmission of disease tendencies in the human subject. This is especially true of tuberculosis,

which, as we know, will show itself through many generations, particularly in the young, requiring but the shadow of an exciting cause to incite active disease.

But, on the other hand, such a direct transmission cannot be shown strictly to operate in causing phthisis pulmonalis, for, although some families seem to show a marked tendency toward the acquisition of all sorts of catarrhal diseases, still, we often observe that several, or even many, members of such a family will entirely escape the acquirement of phthisis pulmonalis, even under considerable provocation.

There has been much discussion upon the question as arising here, and also concerning its existence as a congenital affection. Dr. Schwer, upon statistics based upon 123 autopsies of children (from 1879 to 1883), concluded that phthisis pulmonalis, or rather "tuberculosis," was not congenital, and yet he found that of this number the liver was the seat of tuberculosis in 104, the lungs in 103, the intestine in 63, the meninges in 53, and the thyroid gland in 12. It is plain that these statistics ought not to apply to phthisis pulmonalis.

The New York Board of Health, in 1886, reported that of 8540 deaths of children under one year of age 761 were reported as tuberculosis. That tuberculosis is often congenital, regardless of climate, it seems cannot be doubted by anyone who has had much experience with the diseases of children in the large cities. But the inheritance of a direct tendency to phthisis pulmonalis is extremely problematical. Dr. Landouzy (*Medical Record*, June 17, 1886) believes that congenital tuberculosis from birth to two years of age is more frequent than supposed, often not otherwise localized than as a broncho-pneumonia. Dr. Didama, on the other hand, believes, from the absence of *tubercle* in the *fœtus*, that it is not inherited. He quotes from insurance statistics many cases of phthisis, where both parents were healthy. Just what the advocates of the *purely bacillary* theory mean by *hereditary tendency* is not plain, since no particular condition or group of features is given as indicative of it, so that we are led to ask with Ruhle, of Bonn, how, by heredity, is a tubercular nidus formed in the body? We are all constantly assailed, they say, by the microörganism, but those only fall a prey who are susceptible, by virtue of some previous disease as a nidus—such as catarrhal inflammation. From this point of view, then, it must be that immunity only is inherited. However, until a proper differentiation between tuberculosis and phthisis pulmonalis is fully established, this conflict of opinion will continue. Nevertheless, we believe it is safe to say, in the light of every-day observation, that tubercular disease is hereditary, and, therefore, develops for the most part in a particular class of persons or animals, while phthisis pulmonalis may occur in any person living in a northern climate, after the acquisition of catarrhal inflammation of the respiratory apparatus.

Concerning the questions of "Contagion," "Inoculation," and "Infec-

tion," there is still much difference of opinion in print, although it is often asserted "nowadays" that an inoculable disease is contagious or infectious. The theory of contagion is an old belief. It was promulgated by Hippocrates and Galen. In Italy, in the middle ages, the law prescribed isolation of "consumptives." This was afterward repealed. The theory of contagion was again revived by Villemin (1865), and Klebs (1877), who found bacteria in sputum. In 1879, Musgrave Clay gave the histories of 111 cases said to have occurred by contagion. Potain, Guérin, Bernard, and others later, have given examples of similar character. In 1884, I believe, the Austrian Minister of the Interior ordered the isolation of "consumptive" patients. Cases of tubercular infection by sexual intercourse have been reported by Fernet in 1885 as examples of contagion. In this connection the experiments of M. Giboux (and repeated by other observers with varying results) are interesting. He caused one set of rabbits to inhale the air expired from phthisical patients, after it had passed through cotton-wool. At the same time he caused another lot of rabbits to inhale the expired air directly from the patients. The former lot of animals did not in any instance contract the disease, while of the latter lot each contracted it.

Dr. C. T. Williams, at the session of the British Association, 1882, from his experience at the Brompton Hospital for Consumptives, denied the spread of phthisis pulmonalis by contagion and infection. Sternberg, in 1882, and others since, failed to produce the disease in rabbits by inoculation, they even failed in some instances to find the bacillus tuberculosis. This result coincides with Dr. Gibbs's observations regarding the absence of the bacillus. Dr. Lynch, of Maryland, from a series of experiments, believes that the bacillus tuberculosis is *not* an essential factor in the production of phthisis pulmonalis. Dr. N. S. Davis, before the American Medical Association, in 1885, called attention to the *chemical facts* connected with the etiology of this disease, and questioned whether the bacillus alone was the cause of phthisis pulmonum. It has been claimed and at the same time been denied that in some animals tuberculosis or phthisis pulmonalis could be produced by inoculation with indifferent substances. Villemin, Cohnheim, Waldenburg, Burdon-Sanderson, Gutten, M. Martin, Wilson Fox, and others, have reported the production of the disease by such inoculations. But subsequent experiments by Dawson Williams were held by Wilson Fox to have disproved this.

Dr. E. L. Trudeau, in 1885, gave the results of the inoculation of rabbits with non-bacillary sputum, in which the disease, "tuberculosis," was not transmitted, as did also Dr. P. Gutten. Prof. S. Sterena, and Dr. B. Pernice, after a series of experiments upon lower animals, concluded that the liquid, after evaporation, of the sputum of phthisical patients is constantly free from bacteria, and when injected into the cornea or peritoneal cavity produces neither local nor general tuberculosis.

That phthisis-producing bacteria are not found in the surrounding atmosphere as a result of evaporating tuberculous sputum, although such organisms may be abundant therein. That respiration for several days in a close atmosphere containing tubercular sputum does not produce tuberculosis in such animals. That animals confined in close quarters and compelled to breathe an atmosphere laden with the dust of dried tubercular sputum do not contract "tuberculosis." That subcutaneous injection of tuberculous matter produces mostly local specific manifestations, as shown by the presence of bacilli in the pus from the lesion, and, after a time, produces "tuberculosis" of the abdominal or thoracic organs or "general tuberculosis." That injection in a trachea, even with a bronchial catarrh, does not cause a specific infection, but a septic croupous pneumonitis.

Again as to the question of contagion, the investigation reported by Dr. Vallien at the meeting of the Société Médicale de Hôpitaux, showing the great diversity of opinion among medical men, is interesting. He sent a list of questions to 10,000 medical men, from whom 123 answers were received. Of these, 57 believed in its contagiousness; 57 disbelieved in it; 7 doubted, and in 2 the answers were incomprehensible. Of 439 cases reported, 213 supported the hypothesis of contagion, and 226 were against it. Of the former, 107 were cases of contagion between husbands and wives; 71 near relatives; 18 were offspring of phthisical parents, and 16 were contracted from distant relatives. There are a number of cases reported of inoculation of the human subject with tuberculous matter or sputum, as for instance the case reported by Elscherung, in 1883, of a young woman who accidentally inoculated her hand while cleaning a cuspidore containing the sputum from a phthisical patient. It has been reported that the phthisis pulmonalis or "tuberculosis" has been known to have been communicated through the agency of flies.

Much more of this sort of literature could be quoted—all more or less conflicting. But enough, we think, has been presented to illustrate that probably much of this confusion of deduction arises from an improper discrimination, at times, between phthisis pulmonalis and tuberculosis.

Our experiments, as far as we have gone, seem to show that the exposure of a *healthy monkey* to the inhalation of *dried sputum* containing the bacillus tuberculosis of Koch, by means of frequent insufflations, *will produce* phthisis pulmonalis. The insufflations must be kept up, however, several times daily, for a period of about six weeks, to accomplish it. Both Dr. Gibbes and myself have also produced so-called tuberculosis in guinea-pigs by the inhalation and inoculation of indifferent substances. We have not tried this on monkeys. To test somewhat the force of contagion we have placed, in restricted quarters, *healthy* with so-called *tuberculous* monkeys without effect. The same thing has been

done with guinea-pigs, as stated by Dr. Gibbes in a former paper, with the same negative result. In the "phthisis wards" of Harper Hospital we have never been able to discover any effects due to contagion, although our microscopist, Dr. Duffield, has found bacilli tuberculosis in the air. Following the experiments of Dr. Vallien, of Paris, we have treated sputum containing bacilli with chlorine gas and sulphuretted hydrogen and then inoculated guinea-pigs with it; at the same time inoculating other guinea-pigs with some of the same sputum which had not been exposed to either of these gases, with equally fatal results, excepting the more rapid course of the disease in the latter animals. The spread of phthisis pulmonalis by the consumption of cow's milk is just now attracting considerable attention. At the recent congress of Physicians and Veterinary Physicians, held at Paris, for the discussion of the subject of "tuberculosis," many papers upon this subject were presented, varying more or less according to individual observation. The majority, however, seemed favorable to the view that cow's milk (*i. e.*, tuberculous cows) was in great part responsible for the spread of phthisis pulmonalis. We have made no experiments as yet in this direction, but expect soon to begin some by feeding monkeys principally with milk obtained from diseased cows.

It would appear, however, from observation in this country, where the consumption of cow's milk is very great, that most of the views expressed were far too radical! Whether or not so-called tuberculosis is transmitted from mother to infant through the milk, is for obvious reasons very difficult to determine. We do not, however, agree with Prof. Edouard Rengi, who states from the basis of six experiments, that mothers do not directly communicate this virus (tubercle) to children through suckling, because both Dr. Gibbes and myself have each notes of two cases of "tabes mésentérica" which undoubtedly originated in this way. My cases were those of previously healthy infants, of healthy parents, and good family history, and were suckled by *tuberculous* or rather *scrofulous* wet-nurses!

The part played by environment and its attending circumstances in the causation of phthisis pulmonalis has received considerable attention heretofore, and it will not be necessary more than to allude to it now. The accumulated experience of years points, without doubt, to the very great influence of unsalubrious habitat and occupation, together with scarcity of, or improper food, in the production of such disorders. Dr. Porter, of the Madras Medical College, reports in the *Indian Medical Gazette*, that during the famine there in 1888, in 459 consecutive autopsies, made during that time, "tubercular deposits" were found in one or both lungs in 30 men ($6\frac{1}{2}$ per cent.), and in 20 women ($4\frac{1}{3}$ per cent.), and 1 child. The deposits were partially in both lungs in 18 men and 16 women. The disease was latent in 18 men and 13 women.

Dr. Bowditch and others have shown by statistics the prevalence of phthisis pulmonalis in low, shady, damp places, while there is already abundant proof of the deleterious effects of unhealthy occupations and crowded institutions or workshops. These latter conditions of life are frequently cited as constituting the principal etiological factor. The experiments of Trudeau are quite illustrative of the point. He inoculated ten rabbits; five of them were allowed full liberty and good food, while the other five were confined. The five allowed to run were not diseased at the end of four months, while the others were. We have not as yet completed our experiments on this line; but, as far as we have gone, have found that unsalubrious surroundings or improper feeding will surely predispose the animal to attacks of catarrhal inflammation which lead eventually to phthisis pulmonalis. According to some authorities, such conditions of life are quite sufficient to bring about so-called tuberculosis in every instance. Others maintain, on the other hand, that such vicissitudes are but coincident or exciting causes and that a *tuberculous focus* in the body *somewhere* must have existed previously, which, under these untoward circumstances, is "lighted up." However this may be, it seems clear that the real trouble lies in an imperfect differentiation between tuberculosis and phthisis pulmonalis. Review, if you please, the mass of literature relating to the so-called surgical tuberculosis; tuberculous joints; tuberculous ulcerations of the skull, ribs, or long bones, and note how at variance with prevailing notions of pathology and clinical observation many of these statements are. We are now engaged in conducting some experiments on guinea-pigs, by inoculations of and exposure to material from so-called tuberculous joints, which thus far do not exactly coincide with modern ideas of so-called surgical tuberculosis.

Our experiments of a therapeutical character are far from completed. We are still conducting a series of experiments upon monkeys and human beings (mostly local measures), at Harper Hospital, Detroit, where we have arranged suitable inhaling rooms and other necessary apparatus, and a room for monkeys and guinea-pigs so arranged as to facilitate the handling and sequestration of these animals for our purposes. For the use of gases on the animals, we have a gas cage capable of being almost, if not quite, hermetically sealed, provided with ground stop-cocks for the ingress and egress of air or gas in any desired quantity. For the use of agents in the form of sprays, the cages are provided with shunting partitions, both perpendicularly and horizontally, and a heavy canvas flap for the front, so that we can confine an animal to a very small space if desired, and thus thoroughly expose it to the medicament. We have used thus far, sulphuretted hydrogen, chlorine gas, arseniuretted hydrogen, iodized air, iodoform (by mechanical insufflation), chlorine water, calcium hypophosphites in solution, carbolic acid, creolin, naphthalin,

creasote, mercury bichloride, mercury biniodide, mercury cyanide, eucalyptol, turpentine, and thymol. While we have gained some knowledge from our work in this direction, it must be confessed that we have only just been introduced, as it were, to the vast field of knowledge yet to be attained.

We have made some attempts, also, to medicate monkeys by the mouth, which is very difficult, and in this connection we have to acknowledge our great indebtedness to our two assistants, Messrs. Thaddeus C. Walker and Robert Walker, for their pluck and zeal in carrying out faithfully our ideas and plans. Our experiments with sulphuretted hydrogen have shown that even in a diluted form it is highly poisonous; monkeys exposed to it while incarcerated in the gas cage, very soon and suddenly lose consciousness, falling (as if struck on the head) in convulsion. That this phenomenon occurs without any premonition is proved by the accidental experience of Mr. R. Walker, who, through an accident to the apparatus, suddenly became exposed to the gas for a very short time, and, without any feeling of premonition, dropped to the floor unconscious; the consequences of which would have been fatal but for the timely presence of Dr. Dumas, who dragged him to the open air. From my reading of medical literature I do not believe that the poisonous properties of this agent are sufficiently appreciated. Thus, some of the sudden deaths reported from the use of the "Bergeron method" of treatment, may be accounted for. May not this also account for some of the hitherto inexplicable sudden deaths reported, and vaguely attributed to other causes, such as Trousseau has alluded to? Neither Catani, Hugen-schmidt, nor Nepse, who have actively advocated the use of sulphuretted hydrogen and sulphurous mineral waters by inhalation, have mentioned any particular danger of this sort. We have ascertained that this gas (sulphuretted hydrogen) is fatal to monkeys when inhaled in greater proportion, with air, than about one to five hundred for more than about three minutes.

A long series of experiments with chlorine gas as an inhalant has thus far yielded no satisfactory results. A great deal of time and labor has been expended in determining the maximum amount of gas (by volume, of course) that a monkey—either healthy or diseased—could respire, for any given length of time. We have finally ascertained that a good-sized healthy Rhesus monkey will stand the inhalation of chlorine gas mixed with air in the proportion of 1 : 3500, for about ten minutes at a time. Those suffering with phthisis pulmonalis do not bear this quantity. Exposure to the atomization of chlorine water is endured more easily, and for a greater length of time. This treatment applied to a man suffering with advanced phthisis pulmonalis caused great distress to respiration, followed by excessive expectoration.

The consequence of the use of too much chlorine, as observed in

monkeys, is increased respiration and excessive cough, vomiting, lachrymation and coryza, and if continued too long, slight convulsions. No effect upon the course of the disease has as yet been noted, except in a few instances the production of increased bronchial catarrh was sure to follow.

Iodoform, which has been so highly written and spoken of for its efficacy in so-called tubercular affections, has been used by us persistently (by means of insufflation, combined in varying proportions with starch or magnesium carbonate) in several inoculated monkeys, as also upon the human subject. In the human cases no benefit could be observed. Of the monkey cases, two were observed to have been benefited, but not saved. We observed, however, that the monkeys treated by it all showed marked evidence of fatty degeneration of the liver.

Arseniuretted hydrogen was used in one instance only. It was pumped—mixed with air—into the gas cage. Its effects were so baneful—causing great distress, nausea, vomiting, and diarrhoea—that it was abandoned. This agent is so dangerous to all animal life that further experiment with it will be postponed until we can obtain safer facilities for its manufacture and manipulation.

Mercury bichloride has been used by inhalation quite extensively, both upon monkeys and in the wards of Harper Hospital, with very promising results. With those cases possessing a syphilitic taint this agent has proved quite efficacious. We use from one-half to one or two ounces of a solution 1 : 3000, for each inhalation in the form of spray.

Mercury biniodide has also given good results when used as an inhalation, in the same proportion as the bichloride, especially in cases of laryngeal phthisis in the early stages. In two or three cases its constitutional effects (diarrhoea and epigastric distress) were observed.

Creasote has shown no particularly good effects, except in destroying the fetid odor arising from a certain class of cases. Neither has turpentine, either alone or in combination with thymol or eucalyptus, proved efficacious, except in cases of simple bronchial catarrh. The same may be said of either eucalyptus or thymol when used alone.

Carbolic acid used as spray, incorporated with petroleum oil, has seemed beneficial in the subacute and chronic forms of phthisis pulmonalis; but, on account of the difficulty of keeping it constantly and thoroughly suspended, it has been abandoned for creolin, which is, from present indications, far superior in its effects and more easily adapted to inhaling purposes.

Hypophosphite of calcium is showing itself to be of decided benefit in the local treatment of the chronic forms of phthisis pulmonum. We are in hopes of being able to report excellent results from it in the future.

The plan of extra-alimentation by forced feeding has not as yet

received much of our attention. We hope, however, to try it with some inoculated monkeys. We are still experimenting with these and other agents, by their local use, and as soon as possible intend to test more thoroughly the qualities and effects of calcium sulphide, salicylic acid, boracic acid, etc., both locally and by internal administration.

A CASE IN WHICH CEREBRAL LOCALIZATION WAS ILLUSTRATED BY THE EFFECT OF MENTAL IMPRESSION.

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MR. I. consulted me about three years ago for a condition of the right wrist and hand, from which he had suffered for several years, and which resembled writer's cramp, but differed from that affection etiologically, and in that the condition was one of tremor rather than of spasm. It was not the result of any special or excessive use of the hand, and was associated with a slight degree of paresis of the right leg.

There was a good deal of occipital pain, which I found to be dependent upon defective action of the ocular muscles. This was completely relieved by prisms selected by Dr. Noyes. Singularly, not only was the pain relieved by the use of the glasses, but the condition of the hand and leg was considerably improved.

As a great variety of treatment had been tried before I saw the patient, and he had suffered much of many physicians, specialists included, I now advised him to rest content with the measure of relief he had obtained, and to desist from further treatment, diverting his mind as much as possible from his condition by active employment.

Pursuing this course he has gotten on in the main very well up to the present time. His general health has improved, and the hand and leg are decidedly better. He is, however, still obliged to write with his left hand, although the right is fairly useful for other purposes.

This was his condition when, a few days ago, he became interested in reading the article in *Harper's Magazine* for May, in which Mr. Chittenden describes his experience in signing, as Register of the Treasury, 12,500 United States bonds in sixty-four hours, and the physical distress which the effort occasioned. As he progressed in the reading Mr. I. experienced a severe pain, beginning in the right hand, running up the arm into the neck, then into the occiput, and at last settling with great intensity in a circumscribed spot on the left side of the head. In describing this pain to me he indicated with his finger as accurately as I

could possibly have done the exact situation of the postero-parietal convolution in which Ferrier locates the centre for the wrist and hand of the opposite side. Some pain was also experienced in the leg.

Now, this gentleman had no knowledge whatever of cerebral localization beyond the broad fact that the brain on one side actuates the muscles on the other. The pain he described could not, therefore, have been the result of suggestion. The conclusion seems inevitable that the phenomena in the hand and leg had back of them a morbid condition of the cortical centre, and that this morbid condition was in such wise influenced by the direction of the mind toward the function of that centre as to express itself in pain. Probably the intermediate link between the mental action and the production of the pain was a vasomotor disturbance.

Experiments, especially those of Amidon, indicate that functional activity of a cortical centre may give rise to an appreciable increase or the local temperature. This observation, however, would seem to show that merely occupying the imagination with a function may excite a degree of disturbance in the centre corresponding to that function.

From a diagnostic point of view, the attack of pain so strangely elicited is important as confirming a cortical origin of the symptoms. From the implication of the leg it is probable that the posterior portion of the convolution was also involved.

If we accept Ferrier's earlier conclusions as to the function of the angular gyrus in relation to the movements of the eyes, we find in the proximity of this gyrus to the postero-parietal convolution a probable explanation of the improvement in the hand and leg when the eye-strain was relieved. The more recent views, however, as to the location of the centre for ocular movements, remove it so far from this region that this explanation scarcely seems tenable.

ATTEMPTED SUICIDE BY HYDROCYANIC ACID POISONING. RECOVERY AFTER THE INGESTION OF HALF AN OUNCE OF THE OFFICIAL SOLUTION.

BY HENRY L. SHIVELY, M.D.,

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THROUGH the courtesy of Dr. W. Gilman Thompson, attending physician to the Presbyterian Hospital, I am enabled to report the following case of hydrocyanic acid poisoning, in which it is believed a larger quantity was taken than in any previously recorded terminating in recovery. The case is also somewhat unique in the exceptionally favorable conditions present for the observation of symptoms:

E. H., a student of pharmacy, æt. twenty-two, was found unconscious in Central Park about four o'clock in the afternoon of April 12th. When

first seen he was half sitting, half reclining, on a bench, with his head extended over its back, with eyes upturned and limbs relaxed. He had vomited about a teaspoonful of greenish material. Efforts to arouse him were unsuccessful. He was removed to the Presbyterian Hospital, and as he was lifted into the ambulance a slight clonic convulsion was observed.

On admission the patient was unconscious, pupils widely dilated, the right a little more so than the left; pulse 86, small and compressible; respirations shallow, sighing and ranging between forty and fifty a minute. There was conjugate deviation of optic axes outward. There was no cyanosis. The face, on the contrary, was of a warm, rosy tint but the surface was cold; temperature *per rectum* 97½°. A faint odor resembling bitter almonds was detected in the patient's breath, which suggested prussic acid poisoning, and a search of the pockets was rewarded by finding a half-emptied, glass-stopped ounce vial of the official dilute hydrocyanic acid, bearing the label of Powers & Weightman. The gastric siphon was passed and the diagnosis further confirmed by testing the first washings, which were mixed with considerable partially digested food, and smelled strongly of prussic acid. On treating with solutions of ferrous chloride and ferric sulphate, and then with potassium carbonate, a characteristic precipitate of prussian blue was obtained.

At first the patient responded with slight movements when pinched, but the coma soon deepened into complete insensibility with abolition of reflexes. The pulse rapidly ran up to 112, and became thready and irregular in force and frequency. The impulse of the apex beat was expansile and vibratory; the heart's action was labored and tumultuous. The patient breathed badly, and death appeared impending. Although the dyspnoea was extreme, there was no pallor of the mucous membranes or lividity, the color continuing of the same bright arterial hue throughout. There was decided trismus, rendering the introduction of the stomach tube difficult, and for a brief space there was rigidity of the limbs. At the same time involuntary escape of the urine was noted.

Lavage of the stomach was persisted in until the washings were perfectly clear and the odor of the poison could no longer be detected. From the first the patient was promptly stimulated hypodermatically with whiskey, camphorated ether, strychnine sulphas gr. $\frac{1}{10}$ and atropine sulphas gr. $\frac{1}{10}$. *Per orem* he received in divided doses two ounces of whiskey and three drachms of aromatic spirits of ammonia in hot water. A stimulating enema of three ounces of whiskey and two ounces of hot water was administered. Dry heat was applied locally to the entire surface of the body and a hot-water bag was placed over the præcordium. Within twenty minutes the pulse, which had become alarmingly weak and irregular, began to revive, the impulses becoming fuller and stronger and their frequency diminishing. There was a corresponding improvement in the respirations and slight movements of the voluntary muscles could be elicited. The faradic current, which had been applied with one pole at the base of the neck over the situation of the pneumogastric and phrenic nerves, the other over the superficial cardiac area and epigastrium, appeared of benefit in maintaining both the heart and respiration. The patient manifested no sign of returning consciousness for two hours, but was out of danger within an hour after his admission.

Two ounces of pale, limpid urine, withdrawn by catheter, possessed the odor of the poison and gave a well-marked blue precipitate with ferric and ferrous salts. The reaction was acid, specific gravity 1017. Small, octahedral crystals of calcium oxalate were present. On applying heat

and nitric acid twenty per cent. of albumin by bulk was thrown down. With Fehling's test for glucose a heavy, ochre precipitate was obtained.

On evening rounds at 7.30 P.M., the pulse was 108, respirations 28, temperature 98.5°. He had fully recovered and conversed freely. Family trouble and a morbid dread of failure in an approaching examination were the causes assigned for his act. He stated that his first sensation after swallowing the acid was a feeling of numbness and anaesthesia of the lips, quickly followed by shortness of breath and loss of consciousness. There was no feeling of constriction in the throat or burning sensation in the stomach. He experienced no nausea and does not remember having vomited.

During the evening there were several loose fecal movements, the first of which was streaked with blood. The urine passed during the night was amber in color; specific gravity 1020, reaction acid. On testing, it no longer reacted with Fehling's solution and the albumin was found reduced to three per cent. The reaction for prussic acid could not be obtained. Beside the albumin there were other evidences of a mild degree of acute, exudative nephritis in the presence of hyaline casts, leucocytes and renal epithelium. The microscope showed numerous dumb bell crystals of oxalate of calcium. The urine of the morning of the 14th was found perfectly normal. On the 13th and 14th patient had a temperature ranging between 99.8° and 100½° and complained of weakness and want of appetite. On the 15th he was discharged cured.

In this case rather more than half an ounce of the fresh officinal solution was swallowed, an amount equivalent to four and eight-tenths grains of the anhydrous acid. This is double the quantity taken in the case reported by Burman (*Lancet*, January 14, 1854), which, up to the present time, has been quoted as the largest dose recovered from. Christison (*Edinburgh Monthly Journal*, February, 1850, page 97) reports a case of recovery after the ingestion of a grain and a half of the pure acid. These two are the largest recorded cases of recovery that I have found. Of interest, as showing the smallness of the dose which is sometimes fatal, Garstang (*Lancet*, 1888, vol. ii. page 15) reports a case in which death followed a single dose of half a drachm of the two per cent. solution of the British Pharmacopœia. Woodman and Tidy report twenty-six cases, all but six of which were fatal. Of these, the smallest lethal dose was nine-tenths of a grain.

In the case here reported, the strength of the acid was tested by experiment on kittens. Two drops of the portion remaining in the bottle found on the patient's person, caused death in two and a half minutes when placed upon the tongue of a healthy kitten. The animal emitted a few sharp cries and was seized with dyspnoea and clonic convulsions. Death was preceded by a brief tonic spasm and evacuation of urine and feces. In the *Revue Médicale* (February, 1845, vol. i. page 265) a case is reported in which the urine was scanty in amount for four days after recovery from the immediate effects of the poison. The effects of hydrocyanic acid and its derivatives in producing temporary glycosuria are well known, but the other urinary changes noted in this case, viz.:

the occurrence of albuminuria, casts, leucocytes, desquamated renal epithelium, and oxalate of lime crystals are, so far as I know, here observed for the first time. The elimination of the drug through the kidneys renders a transient acute nephritis one of the lesions which might naturally be expected, and it is thus highly desirable that in cases of poisoning the condition of the urine should be examined to ascertain whether or not these changes are constant.

Various theories as to the toxic action of hydrocyanic acid have been proposed. The phenomena observed in this case would appear to support the view of Hoppe-Seyler (*Archiv für patholog. Anatomie*, Band xxxviii. page 435) and Preyer (*Die Blausäure physiolog. Untersuch.*, Bonn, 1870) that the acid induces a change in the hæmoglobin of the blood, forming a compound cyan-hæmoglobin, differing from oxy-hæmoglobin in that the oxygen is in stable combination, thus preventing the oxygenation of the tissues and possibly also retarding the elimination of carbon dioxide. This would explain the occurrence of all the symptoms of asphyxia without the supervention of cyanosis. The effect on respiration, however, is not to be considered entirely due to these blood-changes, but also to an action on the respiratory centre in the medulla, as death is produced much more rapidly when the poison is applied directly to the medulla of an animal than when the same quantity is administered by the mouth.

There would also appear to be a direct action on the motor ganglia of the heart and fibres of the vagus, producing a speedy paralysis of the heart's action, out of all proportion to that which would be looked for in ordinary asphyxia. Brunton has shown that the direct application of hydrocyanic acid to the heart of a frog arrests its pulsations, and is followed by a rapid loss of muscular irritability. On voluntary muscles and the peripheral fibres of motor nerves hydrocyanic acid is also a paralyzant, as has been well shown by von Kiedrowski and Reichert in their experiments on the crural muscles and nerves of the frog. On sensory nerves its anæsthetic effect is marked.

As regards treatment, the exhibition of ferrous and ferric salts in the presence of an alkali resulting in the production of insoluble prussian blue would seem to be a rational chemical antidote. The poison, however, is so rapidly absorbed that this is rarely practicable, and after emptying the stomach by thorough lavage it only remains to combat symptoms by vigorous stimulation, warmth, and the use of the faradic current. Cold affusion and artificial respiration appear to have been of benefit in some cases. The indication for the former is doubtful in view of the depressed bodily temperature usually present. The elimination of the acid in the urine, which was conclusively demonstrated in this case, would suggest catheterization as a precaution against a possible reabsorption, as the poison is readily taken up from mucous membranes.

REVIEWS.

DIE FRAGE DES UEBERGANGES GUTARTIGER KEHLKOPFGESCHWÜLSTE IN BÖSARTIGE, SPECIELL NACH INTRALARYNGEALEN OPERATIONEN. Von DR. FELIX SEMON, London. 8vo., pp. 194. Berlin: August Hirschwald, 1889.

THE QUESTION OF TRANSFORMATION OF BENIGN LARYNGEAL GROWTHS INTO MALIGN ONES, ESPECIALLY AFTER INTRALARYNGEAL OPERATIONS. By DR. FELIX SEMON.

DISBELIEVING an opinion, expressed by some observers, that morbid growths of the larynx were liable to transformation into malignant growths, Dr. Semon, the editor of the *Internationalen Centralblatt für Laryngologie, etc.*, determined to study the subject accurately from the collective experience of as many physicians as he could enlist in a series of inquiries which were addressed to all known laryngologists in every portion of the globe. From most of them he obtained replies concerning certain important details in all the cases of morbid growths of the larynx which had come under their professional care. The results derived from the study of these reports, and of certain comments accompanying many of them, have appeared in successive issues of the periodical so ably edited by Dr. Semon, and are now presented connectedly in a reprint. It is almost needless to mention that the pathogenetic significance of this study is not limited to the larynx, but is applicable to the question of presumptive transformations at large. The cases presented in favor of transformation are recorded in sufficient detail. They have been closely scrutinized with intelligent impartiality, and great pains have been taken to eliminate from their histories whatever features appeared to be at all obscure or misleading. The reasons for each elimination are plainly stated in the appropriate connection. The result of the entire investigation, while confirming the views which had prompted the inquiry, has been far more positive than could have been anticipated; and is a new revelation to many laryngologists, certainly to the writer of this notice.

We present in abstract the conclusions that have been derived, and refer those especially interested to the volume itself for the data and the arguments from which they have been drawn.

Two questions were formulated in the summary:

Is transformation of benign laryngeal growths frequent, especially after intralaryngeal operation?

Can the intralaryngeal operation itself be held accountable for any such transformation?

The first question Semon answers negatively in the most emphatic manner. Such transformations have been reported in but 45 cases out of 10,747; spontaneous in 12 instances; after intralaryngeal operations

in 33. These 33 cases occurred out of a total of 8216 cases submitted to operation, or 1 in 259. Only 5 of them, however, are deemed to be undoubted, or nearly undoubted, instances of transformation; a proportion of 1 in 1645. Seven of them are allowed to be probable instances, and if these be included the proportion would be 1 in 685. If several cases deemed doubtful be added to the list, the entire proportion would be 22 : 8216, or but 1 : 373. Consequently, Semon sees no escape from recognizing the fact that the transformation in question is an extremely rare occurrence.

A negative answer to the second question follows as a natural corollary of the negative answer to the first one. Nevertheless, Semon discusses the objections that might be made to such a deduction, for the purpose of displaying their feebleness. He cites a number of instances of repeated and of prolonged operations, some of the cases having extended over a series of years, in which the benign character of the growths has continued unchanged to the very last, and presents them as proof that operative interference has no tendency to render a benign growth malignant. He attributes much of the apparent transformation to malignancy, to actual malignancy, or at least to mixed characteristics from the onset. Furthermore, comparing the instances given of spontaneous degeneration and of degeneration after intralaryngeal operation, he points out that the former occurred in 12 instances out of 2531, or 1 : 211, while the latter occurred in 33 out of 8216, or 1 : 249; so that actually, spontaneous degeneration is rather more frequent in untouched cases than is post-operative degeneration in cases interfered with. Consequently, he is forced to the conclusion that intralaryngeal operations can exert no influence which will transform a benign growth into a malignant one.

Attention is called to some important clinical and pathological features which have become apparent during the course of this investigation. The study has shown that carcinoma frequently begins in the vocal bands, and that malignant growths may present the complete laryngoscopic aspect of benign neoplasms, sometimes to the very termination of the case. It has shown the unreliability of dependence upon the negative results of microscopic examinations of fragments of growth removed endolaryngeally, especially as regards the varieties of mixed growths; and it has thus shifted the responsibility of the diagnosis, in early and doubtful cases, from the pathologist to the clinician.

The labor which has been bestowed upon this collective investigation, one, too, which has been carried out with scientific caution and precaution, has been immense, and can be fairly appreciated only by those who peruse the text, and have some personal familiarity with statistical work and with the difficulty of drawing proper deductions therefrom. The different subjects of clinical and of pathological interest have been discussed with great fairness. The arguments advanced in their discussion are arrayed logically and systematically. The task undertaken by Dr. Semon has been difficult, and it has been executed in a masterly manner. The lesson taught is a most important one; and laryngological literature and therapy will feel its influence for a long time to come.

J. S. C.

LECTURES ON BRIGHT'S DISEASE. By ROBERT SAUNDBY, M.D. Edin., Lond.; Physician to the General Hospital; Consulting Physician to the Eye Hospital, and Consulting Physician to the Hospital for Diseases of Women in Birmingham, etc. With 50 illustrations. 8vo., pp. vi., 290. Bristol: John Wright & Co., 1889.

THE author disclaims in the preface to these excellent lectures, "all pretensions to have said the last word on the many vexed questions" discussed. He has "endeavored to explain within a modest compass the present state of contemporary knowledge, making such additions and suggestions as have resulted from thirteen years' clinical and pathological study of Bright's disease. Some of the material has been previously published, but every chapter has been re-written and every point has been thought out again." The special feature of the work is the collation and comparison of the various theories advanced to explain the morbid phenomena discussed; with critical discussion of the evidence, clinical, pathological, and experimental, upon which these theories are based; and finally a judicial deliverance representing the author's opinion.

The volume is divided into three sections, entitled respectively General Pathology, Clinical Examination of the Urine, and Bright's Disease; the sections being subdivided into appropriate chapters. Bibliographical references follow each chapter, and there is a good general index.

Albuminuria is defined as the presence in the urine of serum-albumin or serum-globulin or their modifications, syntonin and alkali-albumin. The number and variety of the pathological relations in which albumin may appear in the urine, compel us, in the author's opinion, to regard it as dependent not only upon inflammation and grave congestion and other coarse organic changes, but upon slight variations in the mechanical conditions affecting the circulation of the kidney. All these states he would arrange in the following groups:

1. Congestions of the kidney; which may be active or arterial, passive or venous.
2. Inflammation, acute or chronic; which occurs in many inflammatory, zymotic and specific diseases, in gout, in lead-poisoning, etc.
3. New-growths.
4. Degenerations; especially lardaceous degeneration of the renal arterioles.
5. Alterations in the composition of the blood; as in purpura, in scurvy, and in attacks of paroxysmal hæmoglobinuria.

Looked at in this way, the author believes that the difficulties which have beset the discussion of the significance of albuminuria melt away; this result being attained by the absolute surrender of the doctrine that albuminuria signifies Bright's disease, and the acceptance of the view that it is simply the admixture with the urine of albumin diffusing from the blood serum. Saundby does not contend that there is no departure from the normal mechanism of the renal circulation in those cases of albuminuria which Grainger Stewart and others term "physiological" or "functional," but he considers it certain that neither this lesion nor the loss of albumin gives rise to any derangement of health which impairs the working capacity of the individual or tends to shorten his life.

The conclusion from this doctrine is, that there are cases of albuminuria which not only do not require medical treatment, but may be safely accepted by life assurance companies. In these cases the urine is normal in every other respect, there are no tubè-casts, the amount of solid matter excreted is sufficient, and there are no signs of cardiac hypertrophy or of high arterial tension, no renal changes, no œdema. Moxon in 1876 described two forms of latent albuminuria; the "albuminuria of adolescence" and "remittent albuminuria," which Pavy has recently re-named "cyclical albuminuria." The author believes the latter to be clearly dependent upon the erect posture. It seems as if in the early part of the day the circulation in the kidney could not establish a proper equilibrium, but that in a certain number of hours this is attained and no more albumin is lost until after rising the next morning. He cites some cases of benign albuminuria which he has been able to keep under observation for a series of years and in which organic disease has not developed; and gives it as his matured conclusion that albuminuria may occur in dyspeptics and in weakly, overgrown persons without being an indication of actual or potential disease of the kidney. After full discussion of the various theories of the causation of this symptom, he reconciles many of them by accepting each in turn as applicable to certain instances; and concludes that its various causes may be grouped under three headings, as follows:

1. *Hæmatogenous*; the albuminuria being due to alterations in the diffusibility of the blood albuminoids, owing to changes in the salts of the blood or in the alkalinity of the blood serum.

2. *Parenchymatous*; inflammatory changes in the epithelium giving rise in the first instance to an albuminous exudate which must be present in the urine, and secondly by destroying the cell layer and altering the basement membrane, allowing direct transudation from the lymphatic spaces into the tubules.

3. *Vascular*; the walls of the glomeruli probably undergoing alterations of their permeability from the effects of poisons, inflammation, and vasomotor paralysis, while lowering of the blood-pressure and slowing of the blood-current favor filtration of albumin through them.

The cardio-vascular changes the author believes to be, next to dropsy and the state of the urine, the most striking clinical and pathological phenomena met with in Bright's disease. Clinically they are present in cardiac hypertrophy with increased arterial tension, and pathologically the changes described are hypertrophy of the heart and thickening of the small arteries. The author discusses the well-known theories of Traube, of Johnson, of Gull and Sutton, and also that of Buhl. He considers that the cardiac hypertrophy is due first to stimulation of the heart by the presence in the blood of toxic matter due to faulty elimination, and second to increased capillary resistance due to alterations in the density of the blood-plasma. The high-tension pulse is ascribed to the same causes. Uremia, too, is regarded as being dependent upon certain toxic agents arising or accumulating in the blood, which at present have not been identified with certainty. Stress is rightly laid upon the fact that failure of intestinal action is a grave additional feature; as elimination may take place through this channel when the renal function is depressed.

The question of therapeutic interference with a diarrhœa occurring

in the late stages of chronic contracting kidney is one which cannot be readily decided. On the one hand, we have met with cases in which uræmia has seemed to be the direct result of the administration of opium in cases of this kind, where the renal lesion had not been recognized and the diagnosis of chronic diarrhœa had been made. On the other hand, the discharge may be exhausting. Evidently no universal rule can be formulated, but each case must be studied for individual indications.

The section on "Clinical Examination of the Urine," is quite full and reliable. The test for albumin which the author prefers is that made by boiling the upper half of the liquid in the test tube, and adding a few drops of dilute acetic acid. Next to this he places Heller's ring test. Picric acid he does not consider as delicate as either of the two above mentioned.

The different forms of Bright's disease are classified by Saundby upon an etiological basis, under the respective heads of Febrile Nephritis, Toxæmic Nephritis, and Obstructive Nephritis. These terms are self-explanatory. Pathologically, the first division includes cases of acute parenchymatous nephritis and of chronic fatty kidney. The second division is especially associated with the small red granular kidney, and in particular with that form due to lithæmia. It includes the acute nephritis of acute gout and poisoning by animal, vegetable, or mineral poisons, and certain cases of primary acute nephritis usually attributed to chill, but in which there is probably already existing dyscrasia. Such cases are met with occasionally in persons who get drunk on beer and lie out all night. In each of these classes we may meet with the urinary and other symptoms of acute or chronic nephritis, while the post-mortem appearances may be those of acute nephritis, of chronic degenerating kidney or of contracted kidney. While this classification will aid in simplifying the study of the various affections which are included under the general name of Bright's Disease, we doubt whether it will receive general acceptance either by clinicians or pathologists. Unsatisfactory as is the commonly received classification it has the advantage of presupposing the least, of all systems which have yet been proposed; and must, therefore, remain the least objectionable, until better knowledge shall permit us to make an accurate classification.

Saundby's recommendations as to the treatment of the various forms of the disease are judicious and in line with the generally received opinion. We are glad to note that he does not approve of exclusive milk diet in gouty cases. The following will bear quoting: "If a patient suffering from chronic Bright's disease is in fair general health, and the discovery of a lesion has been made more or less by accident, so to speak, we should be careful to do nothing that will worsen his condition by over-vigorous treatment or too severe regimen, but should be content to relieve the symptoms of which he complains, if it is in our power to do so, while at the same time we endeavor to regulate his habits and mode of life in conformity with principles deduced from our knowledge of the etiology and pathology of his disease." All in all, the book is a valuable addition to the literature of its subject. S. S. C.

OUTLINES OF THE HISTORY OF MEDICINE AND THE MEDICAL PROFESSION. By JOH. HERMANN BAAS, M.D. Translated, and in conjunction with the author revised and enlarged, by H. E. HANDERSON, M.A., M.D. 8vo, pp. vi., 1173. New York: J. H. Vail & Co., 1889.

AMERICA's contributions to the literary history of medicine have been but few. Aside from Thacher's *Medical Biography* (1828), the translation of *Renouard's History*, by Comegys (1856), and the compilation by Dunglison (1872), we have been able to boast the production of little more relating to the history of medicine than short addresses and isolated papers of limited scope.

This apparent slowness in the cultivation of what may be called a refinement of medicine is not surprising. Many limitations inevitably surround the prosecution of nearly every branch of literature in a new country. Scarcity of libraries, non-endowment of universities by the State, the dependence of everyone for subsistence upon his own exertions, and the almost universal admiration of financial success, have all tended in this country to keep unpractical accomplishments in the background, and it must be admitted that the history of medicine has been regarded as little better than useless.

Such harsh opinion of the usefulness of study of the history of medicine we believe to be unjust. Correct estimate of the advantages to be gained from the study of history is always difficult. To none is this more difficult than to the busy practising physician, to whom ability to meet the ever-arising exigencies of the present is of such transcendent importance as to render him careless of matters not offering immediate return in that direction. But during the past half century exact methods of diagnosis, dependent upon physical and chemical laws, control of experience by facts deducible from careful study of anatomy, physiology, and pathology, and experimental investigation of the action of drugs, have elevated medicine from the position of a useful art to the dignity of a science. As such it must be dependent for further development in great part upon the results of careful investigation. Fortunately the more complete division of labor, and the increase of wealth which have accompanied this advance, afford time and facilities for the prosecution of experimental studies by a host of investigators equipped with all the appliances of modern science. In his study the investigator often receives material aid from an acquaintance with the work of his predecessors. It stimulates ambition, offers valuable suggestion and direction of both plan and scope of his experiment, affords encouragement to renewed effort in times of disappointment, and sets before him the example of men who have attained eminence as the result of their desire to extend the usefulness of medicine. Who can fail of profit from the contemplation of the quiet perseverance of a Harvey, or a Jenner, or a Darwin, or a Koch?

Hitherto the study of the history of medicine has been prosecuted more particularly by the Germans. The exhaustive works of Sprengel, Hecker, Isensee, Choulant, Hirsch, and Haeser, are familiar to everyone. In 1876 appeared the *Grundriss der Geschichte der Medicin und des heilenden Standes*, of Dr. Baas, an important addition to the literature of this subject. It is now our agreeable duty to call attention to a translation of this work into English, by Dr. Handerson, of Cleveland,

to whose enthusiastic energy are due many additions, more especially relative to medicine in this country and England. The author, too, has very materially co-operated with the translator in placing at his disposal his notes for a second German edition. The number of these additions may be inferred from the fact that the book has grown in size by nearly one-half.

Following the lead of universal history, the author has attempted to trace the development of the medical profession as a whole, rather than restrict himself to detailed biographies of its greater lights. Accordingly, we find much space devoted to description of the position in the community occupied by the physician in times past; his opportunities for education, the respect accorded him by the laity, the restrictions imposed upon him by law, his mode of living, his fees, and his relations with his professional brethren.

In the sixteenth century we find the northern student making his way over the Alps into sunny Italy to attend lectures at Padua, or Pisa, or Bologna; we find him voting for the rector of the university, and having a voice in the regulation of the curriculum; we find him living a lawless life, often drinking immoderately, and careless of property. Tired of one school he joins himself to a band of travelling scholars, singing from door to door, begging food and lodging for the night, until the attraction of some celebrated professor again for a time binds him to a fixed abode. Nor are the students alone in their nomadic life. Professors are often of their number, and few physicians have any settled home.

Anatomy is breaking away from the dogmas of Galen, under the lead of Vesalius, Fabricius, and Fallopius. Montanus is drawing crowds to Padua to witness the first clinical lectures in Europe. But the works of Galen and Avicenna, and the aphorisms of Hippocrates, are still the encyclopædias of medical knowledge, their literary criticism continuing to occupy a large part of the time of the learned professors.

The physician is often, also, alchemist and astrologer. His fees are small, from 8 to 40 cents a visit, according to the means of his patient, and his practice is usually limited, unless he be widely known, so that we find him often driving a trade, in addition to his practice, to eke out a livelihood. On this account he commands little respect from the laity. Uroscopy is the order of the day, and this and the treatment of syphilis often bring him substantial return. Surgery is in the hands of the barbers, owing to papal injunctions upon its practice by the better educated, though in 1579 we find the Pope licensing its practice by physicians in France by special indulgence.

The seventeenth century finds his condition improved. Scientific zeal has been greatly stimulated by the study of anatomy and by the discovery of the circulation. Alchemy, though still in vogue, is giving place to chemistry and natural philosophy. Hippocrates, Galen and Avicenna continue to furnish the creed of the physician, who still keeps himself aloof from the surgeon. Clinical instruction is becoming more and more popular, and as universities spring up in northern Europe emigration to Italy becomes less common. Anatomy is attracting the attention of the laity, and we find them flocking to the anatomical theatre to witness dissections by the celebrated professors, which, however, are still seldom permitted. Learned societies begin to spring into existence,

and with them a greater diffusion of knowledge as books become more numerous.

Toward the end of this century no graver or more dignified person is to be seen than the "*medicus purus*," or physician proper, dressed in his fur-trimmed robe and peruke, with cane in hand and sword at belt. His fees are not materially larger, but with increased respect from the community has come a larger practice, and we find him more comfortable. In this century, too, we find the practice of obstetrics, which has for several centuries been carried on almost exclusively by midwives, coming into the hands of the physician.

In the eighteenth century we see only increased dignity in the position of the physician. He is at the zenith of his fame. Powerful in the community as the exponent of science in all its branches, and beloved as a kind friend and helper in disease, he has never before, and only occasionally since, attained to such universal respect. Boerhaave, van Swieten, Haller, de Haen, Frank, Hunter, in northern Europe, and Morgagni, in Italy, command a degree of homage for their profession unexampled in the annals of any other secular calling.

Legal restrictions begin to limit the practice of medicine to those specially prepared for it. Alchemy and astrology give place to science. Anatomy, physiology, and pathology are greatly advanced. Clinics find establishment in nearly all the university towns of northern Europe, and by the end of the century surgery has been elevated to equality with medicine.

But what need of going further? Within the narrow limits of a review any adequate description of this most interesting development is impossible. We can only hope to impress upon the reader the usefulness of the book to every investigator as affording him encouragement and a key to the literature of medicine in times past. To those less interested in the advancement of their chosen calling it offers pleasant reading for a leisure hour, and stimulus in the example of their predecessors to attempt something for the improvement of the noblest of professions.

J. S. E.

CYCLOPÆDIA OF THE DISEASES OF CHILDREN, MEDICAL AND SURGICAL.

THE ARTICLES WRITTEN ESPECIALLY FOR THE WORK BY AMERICAN, BRITISH, AND CANADIAN AUTHORS. Edited by JOHN M. KEATING, M.D. Vol. III. Illustrated. Svo., pp. xv., 1371. Philadelphia: J. B. Lippincott Co., 1890.

THE third volume of this great work now lies before us, and, upon the whole, it has fulfilled the promises made by the other two. Much more than one-half of the large volume is given over to the surgery of children, and seems to be the fullest discussion of this branch since the appearance of Saint-Germain's book. Among the authors we find such names as Fenger, Senn, Vander Veer, Kelly, Ketch, Bradford, Macewen, Gibney, Gerster, and others—sufficient guarantee for the excellence of the articles. Among the medical articles are found some of very great value; the article on the Blood, by Crozer Griffith, although diffuse, can be picked out as especially important. Unfortunately a greater part of it

applies to adult life, and therefore its diffuseness. How dangerous the innate desire for thoroughness becomes is seen in the article by Senn; he devotes nearly two pages to the description of Acute Pancreatitis, of which he says that "only a few well-authenticated cases of this disease have been reported, and none of the patients were children." In the discussion of the physiology of the pancreas, to which he devotes over three pages, he has studied Herman, Heidenhain, and Schiff; he even records the beautiful case of Busch; but he does not mention Korowin and Zweifel, whose researches are of the highest importance, indeed making the digestion by the pancreas a characteristic act in infants. Among the other medical articles, Holt's deserves especial mention, containing much that is original and discussing the whole subject in an impartial manner, which is in decided and pleasing contrast with most of the articles we are in the habit of reading. The articles by Hare, Edwards, and Jacobi show much thought and good, patient research, while the one of Booker is the result of original investigation on a subject so very important, but still so far in the distance. The papers on the Liver, by Chapin, Musser, and Hatfield, are very interesting; it is a pity that Chapin did not expand the subject of functional troubles more, as it is capable of bringing up many interesting physiological and pathological questions. The article on "Albuminuria," by Tyson, is brief but excellently put: we miss a description of that condition so common in children, the so-called renal inadequacy. The illustrations are better than the average, and some of the process reproductions are excellent. Most of the woodcuts, however, are not beautiful, from an æsthetic standpoint, notwithstanding their possible value from the surgeon's point of view.

F. F

HISTORY AND PATHOLOGY OF VACCINATION. A CRITICAL INQUIRY. By EDGAR M. CROOKSHANK, M.B., Professor of Comparative Pathology and Bacteriology in, and Fellow of King's College, London; author of *Papers on the Etiology of Scarlet Fever, etc.*; *A Manual of Bacteriology, etc.* Large 8vo., 2 vols., pp. 466, 610, with 23 colored plates. London: H. K. Lewis, 1889.

THIS is an extremely interesting and valuable work, whose title, however, is not exactly descriptive. It is really a History of the Origin and Introduction of Vaccination, with a Discussion of its Pathology. To constitute a history of vaccination in the full significance of that expression, there would be needed an account of the accumulated evidence concerning the results of vaccination throughout the world in antagonizing smallpox and promoting its extirpation. This account Dr. Crookshank has not given or attempted in these volumes.

Vol. I. begins with a full history of inoculation, from ancient times down to the general prevalence of the Suttonian method, near the end of the last century. Then we have an account of the recommendations and practice of Dr. Haygarth, of Chester, England, in 1777, being a system of isolation. According to the report of Dr. Waterhouse, of Boston, this was yet earlier brought into use in New England. Next follows the "Tradition of the Dairy Maids," with the story of Farmer Benja-

min Jesty (whose portrait is the frontispiece to Vol. I.), and his vaccination of his wife and sons in 1774; Dr. Edward Jenner's life, his investigations, trials and triumphs, filling more than 160 pages, including a number of Jenner's letters and other papers.

The remainder of Vol. I. is chiefly engaged with a record of investigations by different observers in regard to the pathology of vaccination, its relation to human smallpox, to cattle plague, sheep-pox, goat-pox, and grease of the horse. Dr. Crookshank concludes (p. 459) that "there is no more reason for supposing that human smallpox was," in many experiments which he has mentioned, "transformed into cow-pox than there is for believing that cow-pox, horse-pox, human smallpox, cattle plague, and sheep-pox are all manifestations of one and the same disease." Careful reading of the series of facts given in this volume will, we believe, impress a different conviction upon many minds, namely, that (doubtfully) excluding cattle plague, there is reason for believing that all the above-mentioned disorders are modifications of the same disease. This seems to follow from the observations and experiments of Gassner, Viborg, McMichael, Sonderland, Waterhouse, Ceely, and Badcock. Seaton's language on this subject is: "The common origin, then, of smallpox and cow-pox may thus be considered as established." It is at the same time an important fact, the non-appreciation of which has given rise to much confusion, that the cow, horse, and other animals are subject to different eruptive affections, not all identical with variola, or capable of taking the place of vaccinia, or of equinia, the variolous horse-pox.

Dr. Crookshank's closing chapters in Vol. I. relate to the "Introduction of Vaccination in Foreign Countries," and "Progress of Vaccination in England." The first of these subjects is disposed of in eighteen pages; the second, with the author's reflections, occupies nearly forty pages. The narrative contained in the latter is very incomplete. The latest English document expressly referred to is the *Blue-book on Vaccination*, compiled by Dr. Simon in 1857, on which Dr. Crookshank curtly remarks: "It would be out of place here to analyze that report, but it remains as evidence of the extraordinary hold which the Jennerian doctrine had upon the minds of even distinguished sanitarians." After a detailed account of many occurrences of "spontaneous cow-pox" in England and other countries, we find at last a clear announcement of Dr. Crookshank's opinion on the main subject of his work. This, as he tells us, has been reached by his "investigations into the history, and especially the pathology, of vaccination." He asserts that "neither do cow-pox, horse pox, sheep-pox, cattle plague, or any other radically dissimilar disease, exercise any specific protective power against human smallpox." "For the eradication of this disease we must in future resort to methods similar to those proposed by Haygarth, which in modern times have been so successful in *stamping out* diseases of the lower animals." "There can be no doubt that ere long a system of *compulsory notification and isolation* will replace vaccination." "It is probable that when by means of notification and isolation smallpox is kept under control, vaccination will disappear from practice, and will retain only an historical interest."

For such conclusions the volumes before us afford neither good prac-

¹ Reynolds's System of Medicine, American edition, vol. i. p. 177.

tical evidence nor sound reason. The value of an otherwise fine work is greatly impaired by their statement. They are contradicted by an immense mass of facts which the author simply ignores. Take, for example, only such facts as these: At the close of the last century Dr. Lettsom and Sir Gilbert Blane estimated the smallpox death-rate in England and Wales at not less than 3000 per million of population. Since the era of vaccination, no country in the civilized world has suffered any large fraction of such a mortality from smallpox. From 1854 to 1865 the rate in England and Wales was 202 per million; 100 per million is now a probable average. In Ireland during the years 1866-'69 there was no smallpox. In Boston, Mass., from 1873 to 1881 two deaths only occurred from it. So far as vaccination fails to extirpate smallpox, the explanation is plain: it is *the imperfection with which general vaccination is carried out*. Isolation will never replace the Jennerian preventive; it may and should properly supplement it. The publication of Dr. Crookshank's unwarranted speculative opinions is much to be regretted; not because they are likely to affect many medical minds, but because so imposing a work, in some respects so meritorious, coming from a member of the profession, may present to unprofessional readers an appearance of authority which does not rightly belong to it.

Vol. II. contains a number of very interesting documents and essays; beginning with Jenner's "Inquiry," reprinted from his first edition, of 1798, and ending with Dr. Crookshank's own account of "An Outbreak of Cow-pox near Cricklade (Wiltshire)," in 1887. These volumes are handsomely printed, and the plates in Vol. I. add much to the value of the text. Altogether, the work is entitled to a place in every well-furnished medical library. It is a storehouse of extremely important facts from which wiser conclusions may be established than those which are reached by the author. His zeal and labor may be commended, while his lack of judgment must be lamented.

H. H.

ARBEITEN AUS DER ERSTEN MEDICINISCHEN KLINIK ZU BERLIN. HER-
AUSGEGEBEN von DR. E. LEYDEN, o. ö. Professor, Geh.-med. Rath,
Director der I. medicinischen Klinik zu Berlin. I., Oct. 1888 bis Oct.
1889. 8vo., pp. 273. Berlin: August Hirschwald, 1890.

THIS octavo volume of 273 pages is a reprint of articles that have appeared during the past year in various medical journals. The authors are four in number: Leyden, Klemperer, Renvers, and Scheurlen, and they are to be congratulated on having presented in this book, a noteworthy contribution to clinical medicine. The article by Leyden on the prognosis of heart diseases, with which the work begins, is doubtless familiar to students of German medical literature, and the same is true of Klemperer's contributions on the motor activity of the stomach, dilatation of the stomach, and the dyspepsia of consumptives. The articles by Renvers on "Empyema," and that of Scheurlen on "Pyothorax Subphrenicus," deal in a masterly manner with subjects of great clinical interest.

One of the most interesting, although one of the shortest, papers is the

report of a case of carbonic oxide poisoning, by Leyden, in which recovery took place after transfusion. Leyden makes the interesting statement that, so far as he has been able to ascertain, this is the only case of carbonic oxide poisoning which has been treated by transfusion during the last fifteen years. The increasing number of cases of this form of toxæmia, due to the introduction of water gas, makes it important to emphasize the fact that after a thorough trial of the ordinary means of resuscitation, transfusion, preceded by venesection, should be performed. It is scarcely necessary to say that the fluid transfused should be blood, either pure or defibrinated.

Although the experiments of Hunter tend to demonstrate that transfused blood possesses no nutritive value, they also show that the "red corpuscles transfused remain for a certain time within the circulation of their host." This is the important point—the introduction of new corpuscles—for the old ones are paralyzed by the intimate union of carbonic oxide with their hæmoglobin.

Cases of carbonic oxide poisoning are not often reported, and this one is of particular interest when studied in connection with the remarkable cases of the same sort reported by Stevenson in the last volume of Guy's Hospital Reports.

F. P. H.

THE TREATMENT OF INTERNAL DERANGEMENTS OF THE KNEE-JOINT BY OPERATION. By HERBERT WILLIAM ALLINGHAM, F.R.C.S., Surgeon to the Great Northern Central Hospital, etc. 8vo., pp. 165. London: J. & A. Churchill, 1889.

As "internal derangements of the knee-joint," Mr. Allingham groups all non-constitutional affections of the semilunar cartilages and alar ligament, loose and pediculated cartilages, and hypertrophied synovial fringes. The book has been written with the almost sole idea of elucidating which of these conditions are "likely to be remedied by operative treatment, and how are such operations to be performed" with the greatest degree of success, while minute pathology and theoretical considerations are practically ignored. In this, and in presenting a good synopsis of the pathology as well as excellent description and classification of the various disorders considered, he has succeeded most happily; but, further, by adding many valuable suggestions and original points—more particularly those relating to the semilunar cartilages and alar ligament—he has given to the work a decided individuality and practical worth.

Chapter I. deals with the semilunar cartilages, their anatomy, physiology, and gross pathology, the causes, classification [new], symptomatology, and diagnosis of their displacements. Chapter II. considers treatment of the same. The vertical incision which the author here brings forward as a novelty we have long been familiar with, and had considered it to be the most generally accepted method of exposing the cartilages.

Chapter III. groups abstracts of a large number of cases which have been operated upon by various surgeons, as well as the more full reports of eight cases of his own. Chapter IV., a very instructive and somewhat original one, treats of the ligamentum alaria as a cause of joint in-

terference, and describes its anatomy, pathology, and Allingham's method of treatment. Chapter V. takes up the pathology and treatment of "loose cartilages" and hypertrophied synovial fringes; while the final section is devoted to a consideration of "hydrops articuli." By way of excuse for the inclusion of chronic joint effusions in the work, the author states that he has been led to do so not because he considers them to come properly within the limits of his title and classification, but that he may have opportunity to express forcibly his very decided views—which, by the way, are amply shared by American surgeons—upon the great benefits to be derived from operative measures in many conditions of joint-weakening by chronic effusions.

We are fortunate in now having the formerly scattered and more or less obscure fragments of knowledge of these affections gathered into such concise and useful shape, to say nothing of the many original additions thereto which the author has introduced.

SUPPURATION AND SEPTIC DISEASES. THREE LECTURES DELIVERED AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND, IN FEBRUARY, 1888. By W. WATSON CHEYNE, M.B., F.R.C.S., Hunterian Professor; Surgeon to King's College Hospital and to the Paddington Green Children's Hospital; Examiner in Surgery at Edinburgh University. 8vo., pp. xiv., 102. Edinburgh and London: Young J. Pentland, 1889.

To those who read these charming lectures at the time of their delivery,¹ their reappearance in the present handy volume will be most welcome. It is seldom now-a-days that a book treating of any subject related to bacteriology can reappear after an interval of nearly two years without substantial alteration, so rapid is the growth of our knowledge. Yet this has been possible in the present case, for the recent progress in our knowledge of the etiology of septic diseases has brought to light facts confirmatory only of the carefully formulated theories of the author. These new facts receive abundant recognition in many notes in finer type scattered through the text, thus keeping the book abreast of the times. These, and four illustrations of some of the cocci and lesions described, compose the changes in the present edition; the text remains unaltered.

It will be remembered that the lectures embodied a statement of the modern theory of the causation of suppuration and septic diseases. In the first, the various microorganisms which have been found in connection with suppurative processes are described, and it is shown by the rehearsal of various inoculation experiments in animals and man that these are capable of producing suppuration and abscess. We learn that the frequent occurrence of these microorganisms in the tissues of the body without suppuration makes clear the necessity for certain predisposing conditions before their pyogenic effects can be exerted. The second and third lectures are accordingly devoted to the consideration of the conditions exerting a modifying influence on the action of the bacteria of suppuration in the tissues. Among these are discussed em-

¹ Published in the British Medical Journal of February 25th, March 3d, and March 10th, 1888.

bolism, general and local depression of vitality, inflammation, exposure to cold, injury, the effects of irritating chemical substances, the seat of the inoculation; the species of organism gaining access to the tissues and the amount of it present, its existence alone or in conjunction with other bacteria. The influence of season and locality, and the occurrence of the pyogenic bacteria outside the body are also considered. In conclusion the most careful asepsis, both during operation and in the dressing, is recommended as the only known means of exclusion of the germs of suppuration which offers any certainty of success.

The book is completed by a useful bibliography of the most important literature of the subject, and by an index. J. S. E.

LEPROSY AND ITS PREVENTION, AS ILLUSTRATED BY NORWEGIAN EXPERIENCE. By ROBSON ROOSE, M.D., LL.D., F.C.S. 12mo., pp. 96. London: H. K. Lewis, 1890.

DURING several visits to Norway in recent years the author has had many opportunities of observing cases of leprosy, and of studying the forms and clinical features of the disease as it appears in that country. The especial object of the book is to point out the manner in which the spread of the disease may be arrested, and to invite attention to the lessons to be drawn from recent experience in Norway. A steady diminution in the number of cases, as shown by trustworthy statistics, has been observed. The history and present distribution of the disease, its forms and symptoms, its morbid anatomy and causation, together with its treatment and prevention, are all considered. The disease is regarded as incurable, although it is admitted that some benefit may be derived from the remedies usually employed, and that treatment and hygienic measures should in all cases be instituted.

In 1885 a law was passed in Norway that all lepers (not in asylums) should be isolated in their homes, and that failure to comply with this regulation was to be followed by their compulsory removal to these institutions. Isolation of a leper in his own house means that he must live in one room set apart for him, but he may walk about in the open air and with friends. The Norwegian physicians have convinced their fellow countrymen that leprosy is contagious, and that isolation of the patients is the only efficacious measure for eradicating the disease. The author thinks that there is every reason for expecting that leprosy will become extinct in Norway in the course of a few decades. The book is pleasantly written in a semi-popular style, and can be read with interest and profit by all.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

ACTION OF CAFFEINE.

We have for a long time been familiar with the accounts of various travelers as to the surprisingly stimulating properties of such substances as tea, coffee, kola nut, and guarana. It is, however, remarkable that all these substances contain caffeine, and many attempts have been made to explain the physiological action of this alkaloid. According to some, the special action of this alkaloid is directed to the muscles; according to others, it acts exclusively on the nervous system.

PROFESSOR SÉE (*La Tribune Médicale*, March '13, 1890) believes that caffeine owes this property to its power of increasing the activity of the motor nervous system, both of the medulla and cerebrum. As a consequence of this double action he would find the freedom from fatigue. Further, he claims that caffeine prevents loss of breath and palpitation as a consequence of severe muscular effort, and he states that, from experiments made on thirty healthy individuals, in nearly all cases running did not modify the respiratory rhythm provided caffeine had been administered, while the same individuals running the same distance, at the same rate of speed, suffered from loss of breath, and the number of respiratory movements was tripled.

Professor Sée concludes his paper with the following *résumé*: Caffeine, in small repeated doses, when given to soldiers on the march, facilitates muscular work, not by directly increasing the activity of the muscle itself, but by acting on the cerebro-spinal system. The consequence of this double action is the diminution of the sensation of effort, and the prevention of the feeling of fatigue.

Caffeine prevents shortness of breath and palpitation as a consequence of severe effort.

Under its use, individuals subjected to prolonged violent exertion acquire the characteristics of persons in perfect physical training.

In producing this excitation of the cerebro-spinal motor system, on which depends the increase of muscular tonicity, caffeine increases the loss of carbon by the organism, but it does not restrain the loss of nitrogen, and does not thus in reality save tissue-waste.

A means of preventing tissue-waste, and so preventing the effects of inanition from fasting, is absolutely impossible of realization. With caffeine, although intense work is rendered possible, it is only obtained at the expense of the organism. The animal machine can only operate at the expense of tissue-combustion, and it is precisely in facilitating this combustion that caffeine enables muscular work even during fasting.

Caffeine has thus not the property of replacing foods, but only replaces the tonic general excitation which the general ingestion of food produces. It one could assume that it was the direct, immediate, instantaneous action of foods which stimulated the stomach and the nervous system, and that their alimentary value does not extend beyond this, they could be substituted by stimulants.

Finally, Professor Sée holds that the action of caffeine on the heart and bloodvessels is different from what is generally maintained, and is a much more active stimulant than is usually believed.—*Therapeutic Gazette*, May, 1890.

PROFESSOR E. T. REICHERT has recently published the result of his experiments to determine the action of coffee on tissue-metamorphosis by the calorimetric method.

Healthy dogs were used, and in a fasting condition; having been fed the evening before. Each observation was conducted for six consecutive hours, and always during the same period of the day. During the first hour a normal record was obtained, then the caffeine was given hypodermically and its effects studied during the subsequent hours. Three series of experiments were made distinguished by the difference in dosage.

Dr. Reichert considers that caffeine increases heat-production and as a corollary increases destructive tissue-metamorphosis. It might be supposed that the actual waste of energy is in some way diminished, as, for instance, by a lessened heat-dissipation, the quantity of heat thus concerned becoming apparent in work, but this assumption is nullified by the fact that both heat-production and heat-dissipation are increased, and accordingly that the actual waste of energy was greater. There seems to be no other explanation than that the virtues of coffee in the wear and tear of active life are entirely subjective, and depend upon a general excitation of the higher tissues, and chiefly upon its powerful exhilarant action on the mental processes. The assumed ability of coffee to replace food, or to increase the power for work without corresponding tissue-destruction, is consequently entirely deceptive, and the conditions produced by it are comparable to those observed in the insane, in hysteria, or in fright, where the individual may be capable of performing prodigious feats of strength and endurance, but, nevertheless, at the direct expense of his tissues.—*New York Medical Journal*, April 26, 1890.

THE INFLUENCE OF COFFEE ON THE GROWTH OF MICROÖRGANISMS.

An interesting article has recently been published by DR. CARL LÜDERITZ, concerning the influence of infusions of coffee on microorganisms. Investiga-

tions here reported seem to show in the most unmistakable manner, that infusions of roasted coffee have very distinct antiseptic properties, and the importance of this, from a practical standpoint, becomes apparent at once. If infusions of coffee have a marked deleterious action upon pathogenic organisms, and especially upon some forms which are the cause of epidemic types of disease, it may be a valuable agent for the restriction of these, and may be used for quenching thirst when there is any suspicion as to the contamination of water. Especially may this be true of those epidemics of typhoid fever and cholera which are transmitted almost entirely through the medium of the food and drink.

The influence of coffee infusions of different strengths, varying from ten to thirty per cent., upon the growth of various forms of pathogenic and non-pathogenic microorganisms, was carefully tested. The coffee used in these experiments was roasted Java, and the infusions were made by adding from ten to thirty parts of coffee, by weight, to seventy or ninety parts of boiling water. The coffee, freshly roasted and ground fine, was covered with boiling water, and the infusion thus prepared was placed in a closed flask in a water-bath for about ten minutes, and was then filtered through a sterilized filter.

Various forms of microorganisms were retarded in their growth and life by exposure to the infusions of coffee, but they varied greatly in their susceptibility to its action.

The typhoid bacillus was completely destroyed after an exposure in a five-per cent. infusion for three days, in a ten-per cent. infusion for one or two days. The bacillus of Asiatic cholera was destroyed in a one-per cent. infusion after seven hours' exposure, in a five per cent. infusion after four hours, and in a thirty per cent. infusion after two hours.

This is the most prompt action shown in any of the experiments; the viability of some spores was not destroyed until after an exposure of several days. The cholera spirillum was by far the most susceptible of the organisms used in the experiments, and next to it stood the anthrax bacillus without spores.

It seems probable that the antiseptic action is due to empyreumatic substances formed during the roasting of the coffee. It is not due to the caffeine, for nutrient gelatin containing a percentage of caffeine representing ten, twenty, or thirty per cent. of coffee infusion, exerts but very slight influence upon the growth of microorganisms.—*New York Medical Journal*, May 3, 1890.

THE PHYSIOLOGICAL PROPERTIES OF THE KOLA NUT.

At a meeting of the Académie de Médecine in April (*La Tribune Médicale*, April 10, 1890) DR. HECKEL read a paper on this subject, in which he claims that, even after the extraction of the caffeine by chloroform, his experiments have shown him that the powder of the kola nut still possesses marked properties, especially exerted on the muscular tissue and on nervous excitability. He states that the red substance noted by Sée in his work on the African kola, and which remains in the nut after extraction with chloroform, is a highly complex body, in which the active principles are still to be found, although he has not yet succeeded in isolating them.

The negroes in tropical Africa are able to make a march in one day of

more than forty miles, living simply on a single fresh kola nut, and Heckel claims that he has himself obtained equally surprising results through the use of the dry kola. He states that at his suggestion the French Alpine Club has adopted kola as a stimulant or nutrient in their mountain-climbing expeditions, and their general testimony is that it has rendered them the greatest service, especially in preventing loss of breath and in sustaining muscular strength.—*Therapeutic Gazette*, May, 1890.

ANTIMONY IN INFLAMMATIONS.

In the *Practitioner* for March, 1885, DR. SPENDER pointed out that antimony, in frequently repeated small doses, one-sixth of a grain of tartar emetic, every hour or two hours, has the power of completely dissipating early local inflammations. Acting on this suggestion, Surgeon-Major Lawrie, began the use of small and frequently repeated doses of antimony in the treatment of surgical inflammation at the Afzalgunj Hospital in May, 1885. Since then its use has been gradually extended, and he has come to look upon it as one of the most valuable of drugs, as useful in local inflammations as quinine is in malarious fever. It is now used at the Afzalgunj Hospital in all inflammatory diseases which are not of a specific nature.

It may be given without fear of causing nausea and diarrhœa or depression, even in disease where its use would appear to be contra-indicated—for example, in mucous enteritis, a most fatal disease to children on the plains of India. It has been employed in the treatment of typhoid fever, and is said to cut the disease short in a most remarkable way.

Tolerance of the drug is very soon established; there is no depressing effect unless it is pushed so far as to cause its own peculiar nausea and diarrhœa. It can be administered with cardiac tonics, and there are few, if any, cases which are susceptible of benefit by it in which it cannot be employed in sufficient quantity to do good without fear of inducing depression.

OREXIN.

As a caution against disappointment in the use of this drug, especially in private practice and until further evidence is forthcoming, the experiences of DR. IMREDY and of DR. MARTIN are of interest.

In order to test the value of orexin in promoting the appetite of persons suffering from anorexia, Dr. Imredy gave it to twelve hospital patients. In seven the appetite was somewhat improved, though it was rather doubtful if it was due to the orexin; in five no results followed its use. Nausea and vomiting were frequently induced, especially after its continued use.—*Münchener medicinische Wochenschrift*, April 29, 1890.

Trials with orexin or hydrochlorate of dihydrophenylchinazolin have also been made by Dr. Martin, under Dr. Rosenbach, in Breslau.

The drug was administered to twenty-nine patients, most of whom were not informed as to what was expected to be the result. Some of the patients were given pills without orexin; if the appetite improved under this treatment they were not included in any further trials; if, however, they did not gain in this regard, orexin was given. Others had pills without orexin given

to them and were told that they were to promote the appetite; if under this treatment there was any gain such patients were excluded from further tests, but such as were uninfluenced by suggestion were given orexin.

Out of twenty-nine cases included in the summary, five had their appetites increased to an inconsiderable amount only. In five others there was a similar improvement, though the pills did not contain orexin.—*Deutsche medicinische Wochenschrift*, May 15, 1890.

EFFECTS OF A VERY LARGE DOSE OF ANTIFEBRIN.

A number of cases have been recorded showing that even moderate doses of antifebrin or acetanilide may be followed by toxic symptoms, but no case has until now been reported in which nearly an ounce of this drug had been taken. It has generally been supposed that the toxic properties of acetanilide are due to the aniline from which it is manufactured, and it was, therefore, to be expected that the symptoms occurring in the two cases would be very similar. DR. HARTGE, of Dorpat, who has recently had ample opportunities of observing a case in which a student, who had caught cold, had dosed himself with twenty-eight or twenty-nine grammes (nearly an ounce) of acetanilide, in addition to a considerable quantity of spirit, states that the symptoms only very partially corresponded with those mentioned by Dr. Dehio as due to poisoning by 154 grains of aniline, and which consisted in blue coloration of the skin and mucous membranes, profound coma lasting several days, irregularity and quickening of the respiration, acceleration of the pulse, the smell of aniline in the breath, loss of power of motion, considerable disturbance of the sensory powers, followed by jaundice, with anæmia, albuminuria, and hæmoglobinuria. It is probable that this aniline was by no means chemically pure, but contained several other substances, especially toluidine. In Dr. Hartge's case, notwithstanding the enormous dose of acetanilide which had been taken, a quantity which requires five-sixths of an ounce of aniline to make it, or more than twice as much as Dr. Dehio's patient took, there was no loss of consciousness, of motion, or of sensation, no albuminuria or hæmoglobinuria, and only the slightest trace of jaundice; the blood corpuscles, too, presented their normal appearance and character, there being no detritus or specks of pigment, though the color of the blood was changed to a dark blue, as in aniline-poisoning; also the respiration was rendered rapid and irregular, and the pulse accelerated. The patient complained greatly of inability to sleep, and the cardiac palpitation and dyspnoea produced a feeling as of impending death. No medical aid was sought for many hours after the drug had been taken. When Dr. Hartge saw the patient first he was much struck by the marked blueness of the skin, which was general over the whole surface, but especially dark in the eyelids, the chin, and the temporal regions. There was no puffiness, as in severe cases of asthma, and the general appearance was quite different from that of cyanosis.

Although there had been no vomiting, a glass of red wine was immediately brought up, and the stomach was soon afterward thoroughly emptied, a quantity of bilious matter being evacuated. The treatment consisted in giving sulphate of soda draughts, together with coffee and brandy; also hypodermic injections of camphor in ether, and cold compresses to the head. On the

third day the patient was able to leave his bed, and the blue color had entirely vanished.

In conclusion, Dr. Hartge, who had Professor Dragendorff's coöperation in working out the case, remarks that there is reason to believe that the acetanilide taken by the patient must have been a remarkably pure specimen.—*Lancet*, April 12, 1890.

STROPHANTHIN.

At the Medical Congress held in Vienna in April last, DR. KORALEWSKI reported the results of trials of strophanthus made at the Vienna Hospital. From his experience it is fair to infer that in certain cases strophanthus may be conveniently used in the form of strophanthin.

Strophanthin was given in doses of from $\frac{1}{300}$ to $\frac{1}{200}$ of a grain, the daily amount being from $\frac{1}{40}$ to $\frac{1}{20}$ of a grain. It was administered in the form of:

R.—Strophanthus gr. $\frac{1}{30}$ to $\frac{1}{12}$.
 Water 5ijss.

Sig.—Ten to twenty drops every two hours, or in capsules containing $\frac{1}{300}$ grain of strophanthin.

The effect upon the circulation to strengthen it was apparent in five or ten minutes. Its action to regulate the heart followed some two or three days later, more slowly than with digitalis, and continued some time after the administration of the drug was stopped.

Cardiac dyspnoea and palpitation were relieved by it, the former the more promptly. Diuresis occurred only after continued use of strophanthin, and even then the amount of urine was less than after the use of the tincture of strophanthus or digitalis. The increase in the flow of urine continued several days after the cessation of the strophanthin, and was apparently the result of the increased blood-pressure, and not connected in any way with a direct action upon the kidneys; no symptoms of renal irritation were observed.

Gastric disturbances were very seldom caused, even when the drug was administered for a considerable period; even then strophanthin in the form of capsules was well borne.

The bowels were unaffected, and no cumulative action was observed.

The tincture of strophanthus is, of the two, to be preferred, since its action is more certain, more rapid, and more energetic than that of strophanthin. There are cases in which the tincture of strophanthus, digitalis, and other cardiac remedies are not well borne, and here may be the opportunity for the use of strophanthin.—*Münchener med. Wochenschrift*, April 29, 1890.

BROMIDE OF ETHYL IN PRACTICE.

DR. HUGO STERNFELD, a practitioner in Munich, has used this anæsthetic in fifty-six cases, and advocates its more general employment. He considers that much of the disadvantage under which this drug has suffered to have been due to the impurities with which it was formerly contaminated, and that if a pure article is used its reputation may be improved.

He has found it best to administer it in an Esmarch's mask, and he

counsels a gradual rather than a rapid administration. It is of the first importance to have a pure substance.

For short operations this narcotic is especially appropriate, as the anaesthesia is quickly induced and is of short duration. Recovery is rapid, and usually with much less discomfort than follows the use of chloroform. For children and hysterical patients its easy administration is an advantage.

[Bromide of ethyl is doubtless a convenient anaesthetic, but it is a compound of bromine, and, from a chemical standpoint at least, we are justified in being suspicious of any anaesthetic which belongs to the halogen compounds. Primary anaesthesia from sulphuric ether might perhaps have answered in many of the fifty-six cases.—ED.]—*Münchener med. Wochenschrift*, April 15, 1890.

SALICYLATE OF SODA PER RECTUM.

DR. STEIN mentions a case of rheumatic fever of a severe and very obstinate nature in a lady with a very sensitive stomach, which refused to tolerate medication of any kind when administered by the mouth; he was able to treat the case satisfactorily by means of enemata of salicylate of soda. He gave three enemata daily, each containing from thirty to forty-five grains of the salicylate. The quantity of liquid used for each was about eight ounces.—*Lancet*, March 15, 1890.

SULFAMINOL.

The chemical name of this new antiseptic is thiooxydiphenylamin; it is a bright yellow powder without odor and taste, insoluble in water, but readily soluble in alkaline solutions.

By contact with the secretions of wounds it is thought to be decomposed into phenol and sulphur, and thus exert its action as an antiseptic.

It is said to be without toxic properties, and as a deodorizer it is to be preferred to iodoform, as it is without odor.—*Münchener med. Wochenschrift*, May 13, 1890.

TREATMENT OF CARDIAC DROPSY WITH CALOMEL.

Attention has been again directed to this way of treating dropsy associated with cardiac disease. It is perhaps less used than it deserves to be, partly through fear of mercurial poisoning, and it is necessary that the mouth and teeth should be kept perfectly clean.

Three cases are reported of myocarditis, with very general and great œdema and dyspnœa, in which the good results of this treatment were very conspicuous, and in which the digitalis was not efficacious. To one of the patients three grains of calomel were given four times a day for six days. There was no diuresis until the fourth day, when the urine increased from about twenty to eighty ounces, and on the fifth day to two hundred ounces; the amount of urine gradually decreased, during three weeks, to twenty ounces.

This method is of service in certain cases where other means are useless, and it is not necessary to set up severe mercurialization in order to accomplish desirable results.—*Therapeutische Monatshefte*, April, 1890.

CHLORALIMIDE.

M. CHOAY has succeeded, in collaboration with M. Béha, in preparing a chemical compound which is destined, perhaps, to replace chloral hydrate. This body is chloralimide, which has the formula CCl_3CHNH . It crystallizes in long needles, and is colorless, odorless, and tasteless. It is insoluble in water, but soluble in alcohol, ether, chloroform, and fatty matters. Chloralimide must not be confounded with the other new hypnotic, chloralamide, which is, clinically speaking, chloral formamide. M. Choay considers that the activity of chloralimide will surpass that of chloralamide, seeing that for equal weight it gives more chloroform. It has no disagreeable taste and is permanent, while chloralamide is decomposed by a temperature of 140°F . The dose is the same as that of chloral hydrate.—*British Medical Journal*, May 17, 1890.

CODEINE AS A NARCOTIC.

As a remedy to quiet abdominal pain, codeine has been recommended by Brunton, and in a short paper by DR. G. KOLBER, its use is advocated as a substitute for morphine in tubercular disease of the lungs and larynx. It has the advantage over the usual substitutes for morphine—such as the extract of hyoscyamus, extract of cannabis indica, and so on, in being more reliable in its action, and without some of their drawbacks.

Systematic trials with codeine were made on more than seventy patients of various ages for a considerable period. The dose was from one-half to two-thirds of a grain, or from a grain and two-thirds to two and a half grains daily. It is, however, better to give large single doses than small and more frequent ones; for example, half a grain morning and evening is more effectual than a grain and a half in small divided doses throughout the day.

In some debilitated patients doses of half a grain caused vertigo and mental dulness; when the dose was reduced these symptoms disappeared. With very weak subjects it is well to begin with smaller doses than half a grain.

It also has the advantage over morphine of being less constipating, though there are cases, as tubercular disease of the intestines, where it is desirable to check the diarrhœa with opium.

When used in bronchial catarrh the patients expectorated more easily and less frequently. In simple chronic laryngitis morphine was found to be more reliable than codeine.

In spite of the many desirable qualities possessed by codeine, it is, of course, less reliable in its action than morphine, but in many cases will answer as an excellent substitute for the stronger alkaloid. It is, however, more expensive.—*Wiener klinische Wochenschrift*, No. 12, 1890.

ARISTOL IN PSORIASIS.

Aristol is an amorphous, reddish-brown substance prepared from a solution of iodine in iodide of potassium, and an alkaline solution of thymol. It is insoluble in alcohol, glycerin, and in water, but dissolves readily in ether.

Aristol is a harmless remedy and is efficacious in the treatment of psoriasis,

though the cure is not as rapidly effected as it may be with chrysarobin or with pyrogallie acid.

It is said to be more serviceable in lupus than any other remedy, but it has not proved successful in the hands of some practitioners.

Ten per cent. of aristol in lanolin, or in other suitable medium, is the proper strength. With this remedy we may be able to avoid the well-known inconveniences which accompany the use of the applications at present most employed.—*Berliner klinische Wochenschrift*, No. 11, 1880.

MEDICINE.

UNDER THE CHARGE OF

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REPORT OF AN EPIDEMIC OF INFLUENZA.

ROBERTSON and ELKINS (*British Medical Journal*, February 1, 1890) report the details of an epidemic of influenza occurring at the Royal Asylum, Morningside, Edinburgh, which are of value, as the course of the cases could be carefully followed. 140 individuals were attacked, there being 992 persons in all in the institution. The symptoms may be divided into cerebral, neuro-muscular, alimentary, respiratory, circulatory, and urinary.

Cerebral symptoms.—Frontal headache was one of the most constant symptoms, and was one of the most complained of. Giddiness, light-headedness, or swimming in the head, was nearly always present. Mental depression was also a common feature. Most cases complained of sleeplessness.

Neuro-muscular symptoms.—Pain in the lumbar region was one of the most constant symptoms, and was nearly as distressing as the headache. Next in frequency to the back, the calves and the thighs were affected by the pain. The pains were seldom localized, and were generally darting and shooting in the limbs, and often of a purely neuralgic nature. A feeling of muscular weakness was a characteristic and, the authors consider, the most important symptom of the ailment. It was alluded to by nearly all the patients without suggestion. During convalescence this weakness persisted, and there was sometimes fainting.

Alimentary symptoms.—Appetite was always impaired, and in many cases there was loathing of food and nausea. Vomiting was frequent as an initial symptom, and in some cases continued a day or two. In a small number of cases there was diarrhœa, but oftener constipation. Flatulence was frequent, accompanied by severe colicky pain. In some cases there was pain and tenderness on pressure in the region of the liver.

Respiratory symptoms.—Cold in the head was frequent but not invariable, and the discharge was slight and watery, and lasted but a few hours. Sneez-

ing was rare. The conjunctivæ were suffused in many cases, often with slight lachrymation. In some instances these symptoms were more severe. There were often slight transitory hoarseness and sore throat. Over three-fourths of the cases suffered from dry cough, often troublesome, and sometimes persisting well on into convalescence. Pain in the chest was sometimes complained of, and examination of the chest in these cases always revealed sparse, dry râles, and in some instances moist râles at the bases. Several of these cases passed into bronchitis, pneumonia, and pleurisy, and all the fatal ones were due to chest complications.

Circulatory symptoms.—The pulse revealed nothing characteristic. Dry pericarditis was a not infrequent and a serious complication. The skin of the face and trunk often had a reddish flush when the temperature was high. The face sometimes had a dusky, congested appearance. No characteristic eruption was observed. Herpes labialis was present in a few cases. The patients complained greatly of waves of heat and cold passing over the body, accompanied by periodic, copious perspirations. This latter symptom was more marked than in ordinary febrile states, and persisted after the temperature had reached normal.

Urinary symptoms.—Observations on the urine were imperfect, but in two cases there was acute catarrhal nephritis.

The temperature was an important guide, and was always above 100° in typical cases. In the absence of complications it was always higher on the first evening than subsequently. In the great majority of cases the fever ranged between 100° and 102°.

The duration of typical cases was from two to five days. The symptoms almost invariably much abated after the first day. Rheumatic pains in some parts of the body sometimes persisted for a few days or a week. Anæmia to a greater or less extent was always present after the illness was past, and there was always loss of weight, and the appetite remained very poor.

Relapses were witnessed in 9.2 per cent. of the cases. As a general rule, the second attack was more serious than the first, and headache and fever always recurred. The majority of cases of relapse had a severe pulmonary attack (bronchitis or pleurisy), and in nearly half diarrhœa occurred. In all relapsed cases there had been distinct exposure to air, as by going out too soon. The period elapsing between the two attacks was very short.

The most frequent complication, and one which occurred in all fatal cases, was a species of pneumonia. It was present in 14 cases. It usually attacked both bases; was not of the pure croupous variety; was always preceded by bronchitis, and seemed to be rather a spread of the inflammatory process to the terminal tubules of the bronchi, and finally to the alveoli. The sputum, although fibrinous, was frothy and occasionally streaked with blood, but never rusty-colored. Bronchitis was a common complication. Pleurisy was seen in several cases, and pericarditis was found in 5 of the 10 fatal cases.

Although 10 patients died, no conclusions can be drawn from this fact, as all of the ten were subjects previously debilitated.

The first persons attacked were those who were much in the open air. The authors believe the disease to be a specific fever, but they are in doubt about its contagiousness, and think that if this exists it is only to a very

slight degree. In no case was there only a single system of the body affected.

The treatment was symptomatic. Light diet, antipyrine, salicylic acid, or quinine, enemata rather than laxatives for constipation, as it was found that diarrhoea was easily produced by even the mildest of the latter; expectorants when indicated, hypnotics for insomnia, and tonics during convalescence.

SYMPTOMS OF PERNICIOUS ANÆMIA DUE TO OSTEOMYELITIS.

KNOTT (*British Medical Journal*, 1890, i. 232) reports the case of a seaman, aged thirty-two years, who had suffered on different occasions with pleurisy, remittent fever, and purpura. For three or four weeks he had been losing flesh and strength, and complained of vague pains above the chest, epigastrium, and loins. He looked anxious and ill and was put to bed, although examination revealed nothing wrong except tenderness in the epigastric and hepatic regions, and weak respiratory murmur on the right side. There was marked thickening of the sternal half of the right clavicle, which the patient attributed to a fall from a horse three years previously. After three days he began to lose appetite and vomit food, and to complain of some lumbar pain, and of increase of pain in the chest and back on deep inspiration. The epigastric and hepatic tenderness was greater; there was no jaundice. Four days later vomiting was almost incessant. There was no tenderness in any of the bones; the bowels were obstinately constipated; there was no fever; emaciation was rapidly going on. He continued to lose ground steadily, and became very weak and thin. There was much tenderness about the chest-walls, and for a few days some slight swelling over the sternum, which afterward disappeared. He then had several attacks of epistaxis. Three weeks later he looked like a man dying of pernicious anæmia. Everything he tried to eat caused disgust or nausea. The temperature one night was 100° F.—at other times normal or subnormal. He died of exhaustion on the forty-fourth day.

At the autopsy the body was found much emaciated and of a white, waxy color; the viscera pale, an old cicatrized ulcer in the stomach, and pink serum in the bloodvessels. The cancellous tissue of the ribs and sternum, clavicles and femora was found to have broken down and become transformed into a pink creamy matter. Many of the ribs were quite soft. The periosteum was healthy.

The author says that no suspicion of the osteomyelitis was entertained during life, and that it was discovered quite accidentally at the autopsy. He believes that this was the initial disease, and that the anæmia was the result of it, and says that if this view is correct it would strengthen the theory that the red cells of the blood are formed originally, or in some way matured in the marrow and cancellous tissue of bones.

ABSCESS OF THE LIVER IN TYPHOID FEVER.

E. ROMBERG (*Berlin. klin. Wochenschr.*, 1890, 192) calls attention to the rarity with which abscess of the liver occurs in typhoid fever; as shown by the fact that the different text-books of medicine and monographs on the disease rarely even refer to it. It may be due to one of three causes:

1. Typhoid ulceration of the bile-ducts, and suppuration spreading from this.

2. A purulent pylephlebitis following the intestinal affection.

3. A pyæmic infection, starting from some other part of the body.

There is only one example of the first category reported; this being a case recorded by Klebs. In this the branches of the hepatic duct soon after passing into the liver became large and, for the most part, cylindrical cavities.

A large number of the reported cases belong to the second class. The author details a case of this nature. This occurred in a man of thirty-four years, who, in the course of the second week, suffered repeated intestinal hemorrhages, indicating an extreme degree of intestinal alteration. A few days later the fever assumed an atypical course with irregular remissions, and the general condition was bad. It is probable that at this period the suppuration in the mesentery began, and was spreading and attacking the branches of the portal vein and causing their thrombosis. The first chill occurred on the twenty-fourth day of the disease, and probably indicated the formation of the first of the series of embolisms in the liver. After this there developed the characteristic symptoms of metastatic liver abscess, with irregular fever, chills, intense icterus, progressive enlargement of the liver with tenderness on pressure. The course of the suppurative process in this case was very rapid, only eight days elapsing from the time of the first chill until death occurred. The autopsy revealed numerous ulcers in the part of the ileum joining the cæcum, with suppuration in the mesentery of this portion, and thrombosis of the ileo-colic veins leading from it. The liver was much enlarged, and contained wide-spread thrombosis of the branches of the portal vein and numerous small abscesses. Staphylococci were found in both the thrombi and the abscesses. Two similar cases are found in medical literature, as well as two other cases in which the result of the autopsy alone is given. The author gives a brief account of these.

The third category differs considerably in the various seats of the original source of suppuration from which the pyæmic infection of the liver arose. The author gives brief abstracts of all these cases. In one of them (Louis') the source appeared to be an abscess in the parotid gland. In another (Chvostek's) a *perichondritis laryngea* was the source of infection. Freundlich saw an instance in which the cause was an abscess of the fourth finger and of the elbow, and a similar case is reported by Dunin in which it was a thenar abscess.

In the remaining instances of liver abscess in typhoid fever it is not clear to which of the classes the cases should be assigned.

The author has been able to collect from medical literature 19 cases of the affection, including his own. The number is too small to permit of conclusions as to the conditions which favor the occurrence of this complication.

THE OCCURRENCE OF TYPHOID BACILLI IN THE URINE.

NEUMANN (*Munch. med. Wochenschr.*, 1890, 68) has endeavored to devise a method of clinically diagnosing typhoid fever in cases in which the disease is difficult of recognition. For this purpose he has examined the urine bacteriologically in forty-eight cases. Thorough disinfection of the external geni-

tals was made, and the urine then drawn with a catheter previously sterilized by heat. Eight times he found typhoid bacilli abundant, and three times scattered in the urine. Since normal urine is free from microbes, he considers that the presence of motile bacilli in the urine of a suspected case is an observation of great diagnostic value. A positive diagnosis can, of course, only be made by the completed bacteriological tests.

At the time at which the lenticular spots appear in the skin, foci of typhoid bacilli are deposited in the kidneys. Should any of these include in the infected area a uriniferous tubule, the possibility of the passage of the microorganisms into the urine is provided. In the bladder the bacilli find very favorable conditions for their growth, and they multiply there very rapidly. It is an important fact that the bacilli are still present in the urine during the time of convalescence, and Neumann has found them up to even the twenty-third day.

THE ETIOLOGY OF ASIATIC CHOLERA.

HUEPPE (*Berlin. klin. Wochenschrift*, 1890, 189) concludes, from his studies and from those of Wood, of Edinburgh, upon the nature of cholera, that it is a process limited to the intestine; it is biologically a specific intestinal putrefaction with the production of a specific toxin. The loss of water and the denudation of the intestinal mucous membrane of its epithelium, though important symptomatically, are without etiological relation to the disease. As far as experiments yet indicate, the cholera bacteria, whether entering the system in a moist or dry condition, and whether inhaled or swallowed, always reach the intestine by way of the stomach. It has been found that with a proper selection of nourishment, but without the presence of oxygen, the cholera bacteria produce their poison more energetically and more quickly than under the ordinary conditions of culture in the presence of air. This is in accord with the fact that the cholera process is carried on in man under the conditions of anaërobiosis. Wood has shown conclusively that bacteria in a state of anaërobiosis are much more sensitive to external conditions than when in a condition of aërobiosis. The cholera bacteria, therefore, though very energetically producing toxin in the intestine, are much more sensitive to external agents, so that traces of acid are sufficient for their destruction. They are more easily destroyed in the fresh stool than at any other time. From a clinical standpoint, therefore, it is important to disinfect the stools and the linen at once, since with delay the resistance of the microorganisms increases. A therapeutic indication depending on the facts brought forward is to administer by the mouth some substance which may pass the stomach unchanged, and in the intestine act upon the bacteria. For this purpose salol appears to be best fitted, in the effort to exert an internal and perhaps specific action against the disease.

These observations account for the hitherto puzzling fact that cholera only seldom is contagious, transmitted directly from the sick to the well. The bacteria are in such a susceptible condition on leaving the bowel, that even if they at once find their way into the stomach of a healthy person, they will almost certainly be destroyed by the gastric juice. In a short time, however, the anaërobic cholera bacteria outside of the body, in the presence of air and supplied with proper nourishment, become aërobic.

It is also true that the cholera bacteria in the anaërobic condition are much more particular in the choice of their nourishment than when aërobic; and this constitutes another ground for their increased power of resistance outside of the body. The author also maintains that there is a third form—the arthrospores—which is even more resistant than the vegetative aërobic form. In any case, should any of the forms whose power of resistance has been increased enter the stomach, it would seem that they are not destroyed there, even by the presence of acid, but pass into the intestine, and there complete the *circulus vitiosus*.

Pettenkofer has, with reason, made prominent the epidemiological observation that, as a rule, the cholera infection is indirect, being influenced by external conditions; the principal of these conditions being the variations in the ground-water. With the diminution of the ground-water—*i. e.*, with the diminution in the degree of dampness in the upper layers of the ground, the danger of cholera increases; while with the increase of dampness in the upper layers the danger decreases. The proper explanation of this would appear to be that the cholera germ enters the ground in its most sensitive and least resistant condition. If too much moisture—*i. e.*, too little air and atmospheric oxygen—is present they simply perish. If the ground is only damp, so that air can reach them, as aërobic they increase at the expense of the nutrient matter present. If now, with these viable cholera germs in the ground, the ground-water diminishes, the conditions are those most favorable to aërobic life, and the cholera germs increase. The preliminary conditions are thus fulfilled for a miasmatic spread of a cholera epidemic. If, on the other hand, while an epidemic is in progress the ground-water increases in amount, the bacteria can no longer increase, and are either destroyed or rendered inactive, and the epidemic ceases for want of suitable infectious material. Of course, these bacteriological facts are not the only epidemiological factors; but the conclusion seems justifiable that Asiatic cholera is truly a miasmatic-contagious disease, with epidemiologically marked prominence of the dependence upon external circumstances, the nature of which bacteriologically has now become clearer.

SEVERE CHOREA ENDING FATALLY FROM ACUTE PARALYTIC DISTENTION OF THE STOMACH.

H. M. BROWN (*Lancet*, 1890, i. 848) reports the case of a girl of sixteen years who had had acute rheumatism, and some weeks later developed chorea, attributed to anxiety about domestic matters. She was found to be suffering from severe chorea, affecting the whole body. She was emotional, crying without apparent cause, but had no delusions. There was a loud systolic murmur at the apex. The temperature was elevated and continued so, and the patient had the general appearance of a case of typhoid fever. The pulse became weak and rapid; insomnia was persistent in spite of treatment; there were great excitement and delirium. After about the eighth day the patient's condition improved somewhat, and later the delirium and chorea disappeared. Vomiting and diarrhœa, however, set in, and the abdomen became distended. On the thirteenth day of observation she went

into a collapsed condition, with greatly distended abdomen, and died. There had been no vomiting, and no urine had been passed for twenty-four hours.

Autopsy showed an enormously dilated stomach, forming a huge cystic tumor occupying the entire abdominal cavity, and extending from the diaphragm on the left side to the right iliac fossa. The contents consisted of a greenish-brown fluid containing a large quantity of acid hæmatin. The wall of the stomach was greatly thinned.

The author remarks on the great rarity of acute paralytic distention of the stomach. It is a condition causing death in a few hours with symptoms of profound shock. Two cases of this kind are described by Fagge, and presented almost identical symptoms with the case now recorded—*i. e.*, profound collapse, with great abdominal distention and suppression of urine, preceded by severe vomiting.

WHOOPING-COUGH TREATED WITH TERPINE HYDRATE.

MANASSE (*Therap. Monatshefte*, 1890, 116) gives some account of the constitution of terpine hydrate and of the uses for which it has been recommended, and then reports his own experience with it in the treatment of whooping-cough, having tried it in 41 cases with excellent results. In children less than one year old it may be given in dose of 22 grains per day without any deleterious effects. A careful history of each case was kept, the number of paroxysms being noted daily. In the great majority of cases 22 to 45 grains daily were sufficient in the course of four to five days greatly to reduce the number, or, at any rate, the severity of the attacks; and to hasten the recovery from the attending bronchitis.

In endeavoring to explain the method of its action, he discards at once the former view, that pertussis is in any sense a neurosis of the pneumogastric or phrenic, accepting the theory that the disease is of mycotic origin. As terpine hydrate has been shown by Colpi to possess quite powerful antiseptic properties, we might assume that the value of the drug depended upon its action upon the germs of pertussis. The author is, however, of the opinion that little is ever to be gained by the attempt to cure any infectious disease by attacking the germs themselves, since these bodies are much less apt to be injured by drugs than are the tissues of the human organism. In pertussis we have an inflammatory and catarrhal condition of the respiratory mucous membrane, which, in the severe cases, may increase to a grave condition, blocking the capillary bronchi with mucus and cellular masses, and producing alveolar collapse, lobular hyperæmia, degeneration of the terminal bronchioles, and death. Terpine hydrate does good by causing a contraction in the bloodvessels, and thus producing an anæmia of the respiratory mucous membrane with diminution of its swelling and increase of the secretion.

ALBUMINURIA AND LIFE ASSURANCE.

Until recently, says FRASER (*Lancet*, 1890, i. 846), it has been assumed that the presence of albumin in the urine was in itself sufficient reason for the rejection of the candidate for insurance. A number of observations, however, have been recorded in the last few years which show that albuminuria may occur in persons who do not exhibit any of the general symptoms of

Bright's disease; while, conversely, Bright's disease may exist without constant albuminuria. The presence of albumin in the urine without any recognizable indication of disordered health is the condition in which the greatest difficulty for the examiner presents itself, especially since the shortness of the time in which these cases have been studied renders it as yet impossible to know what proportion, if any of them, afterward develop unmistakable symptoms of structural disease of the kidneys. Many of the persons in whom it occurs are of youthful age; many suffer from indigestion; the quantity is usually small, is not constantly present, and often appears only after fatigue of body or mind.

The author claims that many of the newer and more delicate tests for albumin are liable to give erroneous results. He, therefore, considers that it would be of advantage if one system of testing were always used for life insurance examination, and he would recommend the invariable adoption by medical officers of the well-known test of boiling a small quantity of urine in a test-tube, then adding a drop or two of concentrated nitric acid, and again boiling. On the understanding that the above condition is fulfilled, for the purpose of arriving at a decision with regard to the eligibility of a candidate for assurance, three groups of cases may be adopted:

A. *Those in which the urine contains a large, or fairly large, quantity of albumin.*—If the precipitated albumin exceed one-eighth of the urine after standing twenty-four hours, the proposal should be rejected, unless there exist some temporary disease of the bladder or urethra, in which case the decision may be deferred.

B. *Those in which the urine contains a smaller amount than one-eighth of albumin.*—The proposal should be rejected if there be: (1) Enlargement of the heart; (2) increase of arterial tension; (3) increase in the quantity of urine, to the extent of more than fifty ounces in the twenty-four hours; (4) a specific gravity of the twenty-four hours' urine of less than 1010; (5) a sediment containing epithelial, granular, or fatty casts; (6) with increased quantity of urine and lower specific gravity, a sediment containing hyaline tube-casts; (7) dropsy or a history of dropsy within the last two years; (8) a history of lead-poisoning, or the existence of conditions rendering this form of poisoning probable; (9) a history of scarlet fever after twelve years of age; (10) evidence of gout or syphilis, or a history of these diseases.

C. *Those cases in which the urine contains a small quantity of albumin, unassociated with any evidence of important disorder in health.*—In these cases, the conditions stated under B having been excluded, it seems prudent to adopt the following course: A sample of the twenty-four hours' urine should be re-examined on two or three consecutive days. If no albumin be found on any of these subsequent examinations, the proposal might be accepted at ordinary rates. If, on the other hand, albumin is discovered on any of these subsequent examinations, the proposal should be deferred for six months, when an examination on the above plan should again be made.

SURGERY.

UNDER THE CHARGE OF

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THE TREATMENT OF WOUNDS, AND THE CHOICE OF MATERIAL FOR
DRAINS AND LIGATURES.

At the seventh reunion of the Italian Surgical Society the subject of wound treatment and the choice of material for drains and ligatures was discussed by a number of the members.

BASSINI stated that the employment of sponges was unadvisable, not only on account of the expense, but particularly because of the difficulty of accomplishing thorough sterilization. Wads or compresses of moist cotton should also be rejected, since small threads or filaments are frequently left in the wound, and the same difficulty in accomplishing sterilization obtains as is the case in regard to sponges. He recommends balls of salicylated cotton packed in sterilized gauze, and purified by means of dry heat. In relation to the substances employed for ligature and suture, although catgut is to be preferred from the fact that it is homogeneous with the tissues of the living organism, unfortunately it cannot be sufficiently disinfected, since it will not withstand the action of heat. Silk, however, is very readily sterilized, and in general should be preferred to catgut.

Drainage is indicated only in those cases where it is impossible to close pouches and diverticulæ by the approximation of their surfaces, accomplished by the buried suture, or where infection is imminent.

As to the choice of disinfecting substances it is impossible to speak authoritatively, since no medium has yet been found which is satisfactorily efficacious against each particular form of infection.

Gauze sterilized by dry heat and salicylated cotton to be applied immediately to the wound, with thick layers of non-medicated cotton placed over this, represent the best means of protecting wounds from post-operative infection.

NOVARRO, while conceding that sponges should not be employed, objected to the use of silk in buried sutures, and in case of resection of the viscera. Here catgut is preferable. If previously sterilized in a solution of sublimate, 1 : 100, it will not give rise to infection. When there is imperfect hæmorrhage, or the formation of cavities cannot be avoided, tamponade with iodoform gauze, followed by secondary suture of the wound, will give the best results.

CECCHERELLI stated that the double cyanide of zinc and mercury used as a disinfectant has given good results. This substance is perfectly aseptic, and exercises neither a toxic nor an irritant action upon the tissues. Its antiseptic value has not yet been determined.

CORRADI also objects to the use of sponges. He substitutes them by gauze sterilized by dry heat. Where drainage is necessary, he prefers glass tubes, since these are readily purified. He has always attached more importance to the size of the suture or ligature than to its composition, since the smaller the thread the more readily is it rendered aseptic. For this reason he prefers silk, which he soaks for upward of a year in an alcoholic sublimate solution, 1 : 1000. This solution is renewed every two or three months. Alcohol is employed in place of water because the latter diminishes the strength and consistency of the thread. When it is necessary to use coarse silk this should be subjected to the action of moist heat for thorough sterilization of the central portions, afterward it may be preserved in the alcoholic and sublimate solution. Though dressings need not necessarily be antiseptic, they must be absolutely sterile; this Corradi accomplishes by subjecting them to a temperature of 338° F. for two hours. A quantity of gauze sufficient for the dressing is placed in a metallic box, this is hermetically sealed, is left in the oven for the required time, and is not removed from its box until the surgeon is prepared to apply it directly to the wound.

LAVAGE OF THE PERITONEAL CAVITY.

DELBET (*Annales de Gynécologie*, September, 1889) concludes, as the result of elaborate experimentation upon lavage of the peritoneum, that the liquid used for irrigation should penetrate to all parts of the peritoneal cavity. If it is desired to wash out Douglas's cul-de-sac the trunk of the patient can be elevated, and the intestinal coils which have not been involved in operation or smeared with blood or discharges can be protected by sponges. It is difficult, if not impossible, to free the peritoneum completely from the foreign substances which have entered its cavity by means of lavage. In case of escape of septic liquids into the peritoneal cavity, the operator should at first employ an aseptic irrigation, and this should be followed by one with antiseptic properties. After these irrigations there always remains a considerable quantity of liquid in the iliac and lumbar fossa.

The temperature of the liquid used may vary between 64.5° and 122° F. without producing any marked effect upon either respiration or circulation. The temperature should always be that of the cavity itself, though very hot irrigations have been employed for their hæmostatic action. That such effect is produced by them is extremely doubtful. During the first minutes of intra-abdominal irrigation there is a very considerable quantity of the liquid absorbed; when a normal saline solution is used this practically amounts to a veritable transfusion. The peritoneal cavity may be washed by toxic substances without danger of general poisoning, provided the toxic irrigation is preceded for ten minutes by one of a solution of chloride of sodium of the strength of seven per cent. and is followed by a third lavage with the same solution.

SURGICAL TREATMENT OF LOCAL AND OF GENERAL PERITONITIS ORIGINATING FROM THE APPENDIX VERMIFORMIS.

The subject of peritonitis, as caused by inflammation, and particularly by perforation of the vermiform appendix, is exhaustively considered by DR. A.

KRECKE (*Deutsch. Zeitschrift für Chirurgie*, Bd. 30, April 10, 1890). He states that the variety of appendix disease which leads to peritonitis is the perforative. This perforation arises from ulceration beginning in the mucous membrane, which traverses the whole thickness of the intestinal coats and finally causes sloughing of the serosa. This ulcerative process is nearly always caused by the formation of concretions in the lumen of the appendix; rarely foreign bodies act in the same way. Where no cause for ulceration is found it is readily conceivable that a concretion might have been present, this having been washed away with the exudate.

It is well recognized that these perforations give rise to markedly different symptoms in accordance with whether they develop suddenly or are of more gradual formation. If the process is slow the peritoneal surfaces surrounding the inflamed area have time to form adhesions, so that when the opening into the bowel is finally accomplished, simply a circumscribed inflammation of the peritoneum results. When, however, there is a sudden perforation the contents of the appendix are freely distributed in the general peritoneal cavity, and as a result general peritonitis sets up.

It is to be noted that perforative peritonitis dependent upon disease of the appendix occurs, almost without exception, in individuals who were, up to the time of their attack, in good health and in full possession of their bodily strength. It is self-evident that such an individual is far more able to endure, not only the exhaustive effect of the disease, but also the shock of an operation, than is one who has passed through a long period of exhausting disease. The outlook for success after operation is in the former most favorable.

A further noteworthy peculiarity in appendix peritonitis is dependent upon the anatomical relations of this portion of the intestines. For instance, if there is a perforation in any part of the small intestine, the free motion of this portion of the alimentary tract causes wide distribution of the intestinal contents, so that the infection of the peritoneum becomes at once general. The appendix, however, is far less movable than the small intestine or even the stomach itself; therefore, its contents, even if discharged, will be found only in the portion of peritoneum immediately circumjacent. It can also be readily seen that a much smaller quantity of septic matter can escape from an opening in the appendix than where the bowel itself is wounded.

Clinical facts strongly confirm the truth of these propositions, since in no portion of the abdominal cavity is local peritonitis more common than in the right iliac region.

In considering the inflammation of the peritoneum under discussion, a knowledge of the two forms described by Mikulicz is of great importance. Mikulicz states that upon perforation of the bowel, either the whole peritoneal cavity is at once infected, or the peritoneum lying immediately about the perforation is alone involved. The first form of general inflammation he calls diffuse septic peritonitis. This is characterized by a virulent course. The second form he names progressive fibrino-purulent peritonitis; in this the suppurative process slowly extends, the new masses of pus becoming successively encapsulated. From an operative standpoint, a distinction between these two different forms of peritonitis is of cardinal importance, since in the first an extensive opening of the belly, with elaborate disinfection and drainage, is indicated; while in the second every precaution must be taken not to disturb

the adhesions which protect the general peritoneal cavity from the local process.

Another most important point in the consideration of appendix peritonitis, is the fact that the diagnosis is usually made with great ease. Together with the general symptoms of peritonitis there is usually a history of pain beginning in the right iliac fossa. If the patient is a child, this is an additional reason for suspecting appendicitis, since the age of childhood is most prone to this form of perforative peritonitis.

From the foregoing points it will be seen that this form of peritonitis gives promise of far better results than can be hoped for from inflammation dependent upon perforations of other portions of the alimentary canal.

On first sight, it would seem that a careful review of the published cases might give us statistical results which would definitely determine the value of operation in these cases. Such a study can, however be of little service, unless cases are reported with far more care than has hitherto been observed; for in making comparisons, not only must the form of peritonitis be clearly indicated, but the stage in which operative procedure was undertaken, since in the beginning of an attack the prognosis is far better than where the knife is used only as a last resort. Krecke records two operative cases ending successfully, one of general, the other of local peritonitis, and each dependent upon perforation of the appendix. He notes that the diagnosis was in each case easy, depending in the main upon the seat of pain and tenderness at the beginning of the attack, and being further corroborated by the fact that both patients were children.

Especial attention was paid, before operation, to determining whether or not there was free gas in the peritoneal cavity. The liver dulness was in one case completely abolished; nevertheless, on laparotomy, the presence of gas was not confirmed. This is a further proof of the fact that liver dulness can be made to disappear by meteorism. According to Leube, escape of gas can only be diagnosed when, on placing the patient upon his left side, tympanitic resonance is found occupying the normal area of liver dulness in the axillary line.

The distinction between a diffuse septic peritonitis in one case, and a progressive fibro-purulent form in the other, was comparatively easy, since one exhibited in twenty hours the most violent symptoms of a general purulent peritonitis, while the other, after two days, showed symptoms of very moderate severity. In both cases the therapeutic indications were plain; excision of the diseased vermiform appendix offered the only hope of cure. In the case characterized by a diffuse peritonitis this was accomplished, but in place of suturing the opening into the bowel left after excision, the latter was simply ligated, as it was believed that recovery was impossible, and every means was used to hasten the completion of the operation lest death should take place on the table. When, however, the child improved, the parts were inspected with the object of replacing this ligature by a careful suture; adhesions seemed to have successfully accomplished the closing of the bowel end; these subsequently broke down, and a secondary operation was required for the closing of the opening in the vermiform appendix. In the second case great care was taken not to break up any of the limiting adhesions.

In regard to the after-treatment of perforative peritonitis dependent upon

appendicitis, there is a general agreement that drainage should always be employed. This seems best accomplished by means of iodoform gauze, due precautions against poisoning by a too free use of this antiseptic being taken. In most cases the iodoform tamponade can be removed in a few days, when the wound can be closed.

The treatment of perforation of the appendix followed by peritonitis is operative, and no other measures should be for an instant considered; where the knife is used promptly even the most hopeless cases may recover.

It has been claimed that the purely local form of peritonitis resulting from ulcerations which are slow in their extension is amenable to medical treatment, and that the results of such treatment are far better than can be promised by the use of the knife. It will practically be admitted that appendicitis is identical with a circumscribed peritonitis. The question of operating upon these cases will depend more or less upon the presence or absence of pus. The question as to whether in every case of perityphlitis a collection of pus can be diagnosed, is one of prime importance. The testimony of various authors differs in regard to this point. Krafft found that every one of 106 cases of perityphlitis were accompanied by pus. Holländer believes that of 80 cases which were treated and cured pus was present in all. Leyden, however, claims that an exudate only is present in the early stages of perityphlitis, and that the treatment should be designed for the purpose of preventing the occurrence of suppuration. Krecke believes that in all these cases there is abscess formation, though he admits that possibly there may be exceptions. If perforation occurs, suppuration invariably follows. There are cases in which the ulcerating process does not extend to the serosa, and simply causes a more or less extensive adhesion of peritoneal surfaces. Even in these cases excision of the vermiform appendix is imperatively demanded, since thus the danger of later perforation is avoided. Holländer states that of his 80 cases treated medically not a single one terminated fatally. Though surgery can as yet show no such results, it must be admitted that these statistics are exceptional. Moreover, the subsequent histories of these cases would have a most important bearing, since recidivity is very frequent. Cases have been described in which it seems evident that absorption of abscesses has taken place, yet certainly this is quite exceptional.

Leyden and Israel have given a valuable rule for determining when pus formation is taking place. According to them, if after amelioration of the typical symptoms of perityphlitis the temperature again rises, the pulse becomes more frequent, symptoms of peritoneal irritation appear, and the general condition of the patient becomes worse, the diagnosis of pus formation can be made with great certainty. Under these circumstances exploratory puncture has been advised; this, however, is not to be recommended, since it is attended with danger to adjacent parts, and since, even though it fail to show signs of pus, there can be no surety that the latter is not present. Exploratory incision is greatly to be preferred. After reaching the peritoneum the condition of the parts below can be palpated through this membrane, and, if a collection of pus is found, an incision can be made directly into it. If, however, no abscess is found, Sonnenburg's method of tamponing the wound and making another examination after one or two days, can

be followed. By this means it has happened that an abscess which could not be found has later been spontaneously evacuated through the exploratory abdominal wound.

In regard to the position of the parietal incision no binding rule can be established, since the appendix is movable. Generally a curved incision, such as that made for the ligation of the iliac artery, will be found most satisfactory. This will enable the surgeon to make a retro-peritoneal examination, as well as to reach the seat of trouble directly. If the peritoneum is wounded in the course of the operation, this wound should be closed at once by suture, and need cause no anxiety. In general it will be found better not to open the peritoneum immediately, and to protect carefully the loops of small intestine when the incision is finally made.

Since Toft has found that one out of every three men suffers from disease of the appendix, Krecke holds that excision of this process at birth, as a routine practice, is not so absurd as it would at first seem.

NEPHRORRHAPHY.

The treatment of movable kidney by suture is very carefully considered by DR. W. W. KEEN (*Boston Med. and Surg. Journ.*, June 5, 1890). The author distinguishes between movable and floating kidney. The former lies posterior to the peritoneum, while the latter has a mesonephron and lies within the peritoneal cavity. A clinical distinction between the two is impossible, since one may be quite as movable as the other.

The fact that movable kidney is generally overlooked is evidenced by the statement that of 1032 autopsies upon women 32 instances of this condition were found, while in 392 autopsies upon men it occurred 3 times. Oser calculates that 10 per cent. of mothers have this affection. It is more frequent in women than in men in the proportion of seven to one, and is more than ten times as frequent in the right side as in the left. Floating kidney is, of course, always congenital. The cause of movable kidney is commonly a fall, blow, or other traumatism. At times it originates from either frequent pregnancy or loss of fat. The diagnosis is generally clear: a movable tumor in the flank of the size and shape of the kidney, which can be pushed back into the loin, and displaced to or beyond the middle line, is indicative of the condition. Percussion of the loin assists, but it is less reliable than resistance to bimanual examination. Sometimes the hilum and the pulsating renal artery can be felt. The urine is generally normal, though it may contain albumin.

The discomforts incident to movable kidney are many and decided: Bearing-down or dragging pains in the loins, gastric disturbance, fetid breath, vomiting, and at times marked cardiac symptoms, all have been frequently noted. Besides discomfort there is serious danger to life if the affection is not remedied. Both hydro-nephrosis and abscess have resulted from movable kidney.

In treating these cases a pad and bandage should always be tried first. If this is unsuccessful nephrorrhaphy should be the next resort of the surgeon, since nephrectomy is attended by a high mortality. Four methods of fixation have been recommended:

1. By passing sutures through the fatty envelope of the kidney. This method is regarded as insufficient.

2. By stitching through the fibrinous capsule.

3. By passing the stitches through the parenchyma of the kidney. Only occasionally has any blood been found in the urine.

4. By splitting and stripping back the capsule to obtain cicatricial union between the raw kidney substance and the surrounding tissues. The stitches are passed through the parenchyma where it is still covered by the fibrous capsule. Only four cases have been operated upon by this method—a number as yet insufficient to form a judgment as to its merits.

The third method has given the author very good results. The kidney seems to tolerate the presence of sutures for a long time without trouble. Both extremities of the kidney should be secured by these stitches with four additional threads, two passing through the anterior and two through the posterior lips of the wound, respectively, and penetrating the kidney substance. Fine silk is used as suture material, and the stitches should be left in place. The external wound should not be sutured, as it closes quickly.

In the after-treatment the patient must be kept in bed for not less than one month, and when she is allowed to rise should wear a snug-fitting elastic bandage.

The paper is accompanied by a table of all the recorded cases—128 in number. Four deaths occurred, one not due to operation but to ileus; a second was fatal from inflammation of the pleura due to stitching the kidney to the twelfth rib; in the third death was caused by passing the stitches through an old infarct, resulting in septicæmia; and the fourth from later suppuration, probably the result of operation.

The author has performed four cases all apparently successful, though sufficient time has not yet elapsed to determine what the ultimate results may be in regard to permanent relief.

THE TREATMENT OF VESICAL CALCULUS IN MALE CHILDREN.

In considering the treatment of vesical calculus in male children Dr. J. WILLIAM WHITE (*Medical News*, May 17, 1890) shows that the most powerful argument against the modern operation of litholapaxy, that is, the liability to recurrence, obtains mainly in the aged or in those suffering from marked pathological conditions of the bladder or prostate. In children the bladder is usually healthy and the prostate undeveloped. The urethra is proportionately as capacious as is the case in the adult, and will generally admit, after meatotomy, a No. 16 (French) lithotrite. Among other objections to lithotomy may be urged the fact that there are reported cases of emasculation following the perineal cut, and that statistics show a greater mortality than obtains in the crushing operation. The author believes the following conclusions in regard to the choice of operation in male children justifiable:

1. In every case of calculus in male children¹ litholapaxy, on account of ease of performance, low mortality, speedy recovery, and absence of danger of emasculation, should be the operation of predilection, division of the

¹ These remarks apply almost as well to adults.

meatus being freely resorted to if that portion of the urethra offers an obstacle to the introduction of instruments.

2. The lithotrite and evacuating-tube should be of a size which can be inserted into the bladder without much effort or over-distention, and great gentleness should be observed in passing these instruments.

3. They should be withdrawn and reintroduced as seldom as possible, the stone being finely pulverized before the lithotrite is taken out at all. In seeking for or attempting to seize the stone, care should be taken to avoid such wide separation of the blades as will bring the male blade in frequent contact with the vesical neck. The crushing should invariably be done only after rotating the blades into the centre of the bladder. Every particle of the calculous dust should be evacuated.

4. Rest in bed, milk diet, and sterilization of the urine by boric acid or salol given internally both before and after the operation are valuable adjuncts. During the operation every antiseptic precaution should be observed.

5. The exceptional cases of calculi which are both large and hard may be best treated by suprapubic lithotomy, but neither unusual size nor a moderate degree of density should of itself alone be thought positively to contraindicate litholapaxy.

6. Perineal lithotomy has now a very limited field, and should be employed chiefly in those cases of stones thought to be of small or medium size in which no lithotrite, however small, can be introduced with safety.

A METHOD OF APPLYING ANTISEPSIS IN THE TREATMENT OF RECENT ANTERIOR URETHRITIS.

DR. J. WILLIAM WHITE (*Medical News*, June 14, 1890) in a clinical paper upon the treatment of recent gonorrhœa by antiseptic agents, gives the result of his experience in this class of cases. He states that the evidence as to the causative rôle of the gonococcus in the development of gonorrhœa is daily becoming more conclusive, but that this theory is not necessary as a rationale for the antiseptic treatment of gonorrhœa, since the successful treatment of suppuration anywhere demands the employment of antiseptic agents. He points out the difficulty in the sterilization of the mucous surfaces of the urethra, and classes the topical remedies commonly employed as follows:

(1) Those which, when strong enough to exert a sufficient germicidal action, are locally so irritating as to be harmful or unbearable. This class includes nitrate of silver, carbolic acid, chloride of zinc, iodine, chloral, potassium permanganate, salicylic acid, and creasote, all of which have been faithfully tried in many cases and by competent surgeons. The concurrent testimony is, that when used in sufficient strength to sterilize the discharges, they produce an amount of local irritation and swelling, ardor urinæ, chordee, and even, exceptionally, urethral ulceration, that far outweighs any advantage to be derived from their antiseptic properties.

(2) Those which are such feeble antiseptic agents that they cannot be depended upon to destroy all the bacteria found in urethral discharges. Among these may be mentioned resorcin, thallin, quinine, the sulphate and acetate of zinc, lanolin, sulphur waters, tannin, alum, hydronaphthol, and cadmium sulphate. The clinical and experimental evidence coincide as to

most of these drugs; each has its more or less enthusiastic advocates, but when given a wider trial has been found disappointing, while bacteriologists have shown that the germicidal action was either limited to a very few varieties of bacteria, or was slow and uncertain.

(3) The third class includes a number of agents which are open to the same objection of too feeble or too limited antiseptic action, and have the additional drawback of insolubility in ordinary media and of occasionally becoming mechanically irritating from the formation of concretions. Among these are iodoform, calomel, bismuth subnitrate, oxide of zinc, and other insoluble powders.

Dr. White states that in the above list are omitted the five drugs which, in various combinations, are of the most practical value in attempting by topical treatment to secure asepsis in the inflamed urethra. These are: Corrosive sublimate, sulpho-carbolate of zinc, boric acid, peroxide of hydrogen, and the salicylate of bismuth.

The method of deep irrigation or retro-injection he finds unsatisfactory, but orders instead frequent injections from a large syringe with moderate force, using the strongest solutions that can be given without causing pain, and preventing the fluid from passing too deeply by instructing the patient to sit upon a folded towel during injection so as to occlude the membranous urethra. His results were not materially improved until a solution of sulpho-carbolate of zinc (ten grains to the ounce of the mixture) in a ten to fifteen per cent. lotion of peroxide of hydrogen was added. This provided a formula which, both clinically and experimentally, showed excellent antiseptic properties. The best results were attained when, in addition to this treatment, or often entirely omitting local treatment, six to eight capsules a day were given by the mouth, each containing—

Salol	. . . . .	3½ grains.
Oleoresin of cubebs.	. . . . .	5 “
Para balsam of copaiba	. . . . .	10 “
Pepsin	. . . . .	1 grain

Of fifty-three cases of recent urethritis thus treated, and of all grades of severity, a distinct and unmistakable effect was produced upon the discharge in every instance but two, in which a violent indigestion prevented a thorough trial of the capsules. In about two-thirds of the whole number the discharge almost or entirely disappeared during the first week after treatment was begun. In but one case of the whole number did gonorrhœal rheumatism develop. This was especially noteworthy in three cases which had never before been free from joint trouble during an attack of gonorrhœa.

The author's conclusions upon this subject are as follows:

1. The microscopical and experimental evidence in favor of the bacterial origin of gonorrhœa is confirmed by clinical and therapeutical experience.

2. The results of antiseptic treatment have not been so uniformly successful as would be expected, on account of—*a*, the anatomical and physiological peculiarities of the male urethra; *b*, the difficulty of applying sufficiently energetic local antiseptics; *c*, the necessarily intermittent character of such applications, and *d*, the failure to combine with the topical treatment appropriate internal medication.

3. No one antiseptic agent can be depended upon, in the strength at which it can be borne by the inflamed urethral mucous membrane, completely to sterilize the discharges and the suppurating surfaces. A judicious combination of several antiseptics, if not essential to success, is at least of considerable value.

4. The internal administration of salol in conjunction with copaiba and cubebs renders the urine aseptic and probably antiseptic, so that it acts as an exceptionally thorough and efficient antiseptic injection, shortening the duration of the disease and diminishing the frequency and severity of the complications.

5. The production of urinary asepsis by internal medication is of considerable value not only in the inflammatory affections of the genito-urinary tract, but in the preparation of the patient for operation upon those organs and in the after-treatment.

OTOLOGY.

UNDER THE CHARGE OF

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EAR DISEASE IN INFLUENZA.

PROFESSORS GRUBER and POLITZER, of Vienna, gave a short synopsis of their experience in ear affections during the recent epidemic of influenza, at a meeting of K. K. Gesellschaft der Aerzte, February 28, 1890 (*Prüger med. Wochenschrift*, March 12, 1890). Professor Gruber stated that in the third week in December, 1889, numerous cases of middle-ear disease, of a purulent nature, presented themselves, both in the clinic and in private. These were of a severe type, and resembled the form usually found in connection with an infectious disease like scarlatina or pneumonia. Statistics for December, 1888, and January, 1889, showed that ninety-one cases of otitis media catarrhalis, and ninety-five cases of otitis media purulenta presented themselves to his attention, while in the same period of 1889 and 1890, *two hundred and fifty-three* cases of otitis media catarrhalis, and *two hundred and eighty-nine* of otitis media purulenta came under his notice. These cases were of the most intense form and ambilateral, which is unusual in purulent processes. The process was characterized by extraordinary hyperemia, which extended to the neighboring osseous and soft tissues. The membrana tympani was more frequently than usual implicated from the beginning, and soon showed extravasation of blood in its tissue, and ecchymoses also appeared on the wall of the auditory canal near the membrana tympani. The discharge from the drum-cavity was also more or less hemorrhagic at first, but subsequently become copiously purulent. In six instances artificial perforation of the mastoid became necessary. The mastoid cells were found filled with pus,

the bony structure broken down, and the pus cavity sometimes filled with granulations. In two cases burrowing abscesses formed. These grave symptoms ensued though the cases were treated carefully from the outset.

Professor Politzer limited his remarks to those cases in which the results of the influenza were suppuration of the middle ear, perforation of the membrana tympani, and abscess in the mastoid. In eighteen cases of abscess in the mastoid, ten cases were undoubtedly due to influenza-otitis. Typical symptoms occurred as follows: copious blennorrhœic discharge, swelling of the external auditory canal and surrounding parts, tenderness and swelling of the mastoid, and in most cases fever. These cases did not yield to antiphlogistic treatment, as apparently similar cases in other years had done. The pus cavity was found at a depth of $\frac{1}{4}$ to $\frac{1}{2}$ cm. filled with granulations, or with greatly congested and rough mucous membrane, which easily bled when touched. These cavities were generally isolated, communicating only twice with the antrum mastoideum. In the ten cases operated on the discharge ceased in three or four days after the operation and the opening closed. In one case an abscess formed in the occipital region. In another case, affected with chronic Bright's disease, there was a fatal termination, post-mortem examination revealing extensive meningitis.

FORMS OF OTITIS FOLLOWING GRIPPE.

Under this title DR. HERMET presents his experience in ear diseases following the recent epidemic of influenza (*Gazette hebdomadaire de Méd. et Chirurgie*, March 8, 1890). He is of the opinion that the otitis of influenza differs from the ordinary type of inflammation of the middle ear. Its course is abnormal, its intensity greater, and serious complications more numerous. Examination of the ear reveals redness and swelling of the external auditory canal, and hyperæmia of the membrana tympani, with disappearance of its normal contours. In one case observed by Hermet, in a child, in which he was preparing to perform paracentesis of the membrane, vomiting on the part of the little patient ruptured the membrana. A bloody discharge from the drum cavity at once followed, coming out through the auditory canal, and a purulent discharge came into the mouth from the middle ear through the Eustachian tube. The pain continued unabated for three days after the spontaneous rupture of the membrana tympani. The discharge continued with great copiousness for two weeks, a feature noted in other cases of otitis media following grippe. Inoculations of the matter in these cases, performed on guinea-pigs, proved negative in result.

AURAL REFLEXES CAUSED BY A COLLECTION OF CERUMEN IN THE EXTERNAL AUDITORY CANAL.

The reflex disturbances noted in this case existed for several months, and consisted of pain, palpitations of the heart, twitchings in the head and nucha, and vertigo. They disappeared promptly and entirely by the extraction of a plug of cerumen from the ear, which was accidentally discovered in the ear. It had not interfered in any way with the hearing.—I. HERZOG, *Monatsschrift für Ohrenheilkunde*, May, 1889.

EXOSTOSIS IN THE EXTERNAL AUDITORY CANAL.

DR. ROBERT BARCLAY, of St. Louis, has given an account of an exostosis in the left auditory canal of a man, twenty-five years old, which acted as an obstruction to the outflow of pus from a chronic otitis media (*St. Louis Med. and Surg. Journal*, February, 1890). "The obstructing body was extremely hard, immovable, covered with a thin, glistening, pearly membrane, but not hyperæsthetic." As the tumor was increasing in size, a prognosis of a very unfavorable nature was given should further increase in the size of the exostosis cut off the escape of pus from the middle ear. It was proposed to remove the bony growth by means of a burr or reamer, run by the dental lathe. This was acceded to, and after the administration of chloroform, the canal was illuminated by lamplight. A long narrow burr, or reamer, tapering to a four-sided pyramidal point, $\frac{3}{4}$ of an inch in diameter, devised by Dr. Barclay, was adjusted to the handpiece of the surgical engine (S. S. White). The reamer was then directed from the middle point of the external groove above the exostosis inward and slightly downward until it was felt to emerge on the other side of the tumor. It was then pressed broadside, first backward and then forward, until the neck of the tumor was divided, when the tumor was removed with the foreign-body hooked curette. The base of the tumor was then stroked with the broadside of the reamer, from side to side, parallel to the surface of the normal canal wall, as closely to it as the soft tissues would permit. Syringing with hot water checked the hemorrhage. There were no bad sequelæ. The after-treatment consisted in cleansing with a solution of bichloride of mercury or with peroxide of hydrogen, followed by insufflations of boric acid. A complete cure was effected in one month.

CARIES AND EXTRACTION OF THE ANVIL; ETIOLOGY AND TREATMENT OF CHRONIC SUPPURATION OF THE MIDDLE EAR.

The frequency of caries of the anvil and the necessity of the extraction of this ossicle in certain cases of chronic suppuration of the middle ear, are the subjects of the article with the above title, by DR. LUDWIG, of Halle. (*Archiv f. Ohrenheilkunde*, vol. xxix., March, 1890.)

The diagnosis of caries of the malleus, and the excision of the same, are comparatively easy. But the suppuration of the middle ear often continues after the diseased malleus is removed, though no other carious spot can be either felt or seen, in the tympanic cavity. "The anvil is, as a rule, not detectable by the eye or probe," and hence its disease not to be diagnosed with certainty; and yet not unfrequently disease of this bone is the only cause of continued suppuration in the ear. As the anvil has no further functional importance after the excision of the malleus, and as very often, after excision of the malleus, the anvil is syringed out in the after-treatment, Ludwig, as Sexton, of New York, has done for years, always removes the anvil, if present, after extraction of the malleus. All of Ludwig's operations, by the way, were performed last summer (1889), and as he appears to imply priority in this modification of the operation of excision of the ossicula auditus, he must be unaware that in this country Sexton has done it for years, and published accounts of his work (*Transactions American Otological Society*

for 1886, p. 521; also Sexton *On the Ear*, p. 374). Dr. Ludewig publishes now accounts of thirty-two cases, nine of which are from the private practice of Schwartze. He also describes a special form of hook ("anvil hook") for removal of the anvil, which is not equal in any way to that of Sexton, already described elsewhere as early as 1886.

The results of the operation of hammer-anvil extraction in the thirty-two cases are as follows:

Suppuration cured in	20 instances.
With regeneration of the membrana tympani	5 times.
Without " " " "	15 "
Still under treatment	11 cases.

One patient died of meningitis and pyæmia from long-continued caries and cholesteatoma of the middle ear, and not as the result of the operation. The effect on the hearing was varied. In two cases it appears to have been made worse; in ten cases it was unaltered; in the remainder, *i. e.*, in twenty cases, it was improved, *e. g.*, in one case from fifteen centimetres to two or three metres, and in another from five centimetres to one metre. The tests were whispered numerals applied both before and after the operation.

In two instances facial paralysis followed the endeavors to extract the incus, or its remnant, from the attic by means of the attic hook. In the first instance recovery took place in the course of seven weeks; but in the second case the paralysis had not disappeared six months after its occurrence. It would seem from our experience with this operation that too much force was exercised in the application of the hook to the attic cavity.

OTITIS EXTERNA HÆMORRHAGICA.

DR. GORHAM BACON, of New York, reports five cases of this disease, the only ones observed in two thousand five hundred aural patients. His conclusions are as follows:

- "1. Otitis externa hæmorrhagica is a rare form of disease.
- "2. It should be considered a disease *per se*, an inflammation of the external auditory canal.
- "3. It occurs more frequently among the young, although it may be found in the case of those advanced in years.
- "4. Males are more frequently affected than females. The left meatus is more frequently involved than the right. The pain is usually not severe.
- "5. The vesicles are usually found on the inferior wall of the bony auditory canal, although they may be situated on the anterior or posterior walls, and even extend to the drum-head." (*Archives of Otolology*, vol. xix., Jan. 1890.)

Such a condition of the external auditory canal and drum-head was seen, even in both ears, in numerous cases of influenza otitis media in the recent pandemic, as observed and reported by Haug, of Munich, and others.

OBSTETRICS.

UNDER THE CHARGE OF**EDWARD P. DAVIS, A.M., M.D.,****PROFESSOR OF OBSTETRICS AND DISEASES OF CHILDREN IN THE PHILADELPHIA POLYCLINIC;
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PREGNANCY WITH CONGENITAL CLOSURE OF THE VULVA.

HEYDER (*Archiv für Gynäkologie*, Band xxxvi. Heft 3) reports the case of a patient aged twenty-two years, brought into the hospital six months advanced in pregnancy, with the history of having fallen and caused hemorrhage and pain; upon examination almost complete closure of the vagina and vulva was found by a membrane forming a blind sac; upon closer examination a very small opening was discerned under the symphysis. The history of the patient was that when three years old she was run over by a wagon, and so injured as to create two scars, one on the left side of the abdomen beneath the ribs, the other on the left side of the vulva. She could give no other cause for this deformity. Menstruation had been regular. On closer examination a double membrane was found enclosing a space between into which a small opening could be discovered. As labor was impossible without some operation, a sound was passed through the opening, the membrane removed by thermocautery, the edges trimmed with scissors, and the wound in the vagina was closed with fine silk; the patient went through a normal pregnancy, and was delivered by normal labor.

The case is one of congenital malformation, and cannot be ascribed to the accident which the patient narrated in her history.

THE USE OF CHLOROFORM DURING LABOR.

At a recent meeting of the Obstetrical Society of Paris (*Bulletins et Mémoires de la Société Obstétricale et Gynécologique de Paris*, No. 1, 1890) PORAK advocated the use of chloroform during labor, stating that he had prolonged its use at intervals during six, eight, ten, and even twelve hours. He gives it by a mask which allows but little chloroform to escape into the atmosphere; he has employed from one and a half to four ounces of chloroform at one labor; examination of the fœtus has exhibited traces of chloroform shortly after labor, proving that the vapor passes easily from mother to child. Porak considers it the best and least dangerous anæsthetic for labor, and has never seen ill results following its use; he endeavors not to give it before the period of dilatation is complete; in discussion, Pajot and Budin agreed also in recommending chloroform.

SURGICAL TREATMENT OF IMPACTED LABOR.

LAWSON TAIT (*British Medical Journal*, March 22, 1890) describes his method of amputating the uterus in impacted labor. There are necessary for this operation two or three pairs of catch forceps for arresting bleeding

points; a small sharp scalpel; two or three bayonet-pointed suture needles, some silk, a piece of India rubber drainage-tube, and two steel knitting needles. The first step in the operation is an abdominal incision four inches long through first the skin and then the muscles down to the rectus; then the tendon of one or the other of the recti is opened, the muscular tendons fall aside, the posterior sheath of the tendons is taken up by two pairs of forceps; the extra-peritoneal fat is drawn up similarly, then the peritoneum raised again by two pairs of forceps, and a slight notch made between them; the finger is then introduced into the peritoneal cavity, and the relation of the uterus and bladder exactly ascertained; the peritoneum is opened to the full extent of the incision, the drainage-tube about eight inches long is held as a loop between the fourth and middle fingers of the left hand, slipped over the uterus and pulled down over the cervix; a hitch is then made in the tube as low as possible, and is pulled tight; a second hitch may be made which had better be given to an assistant; a small hole is then made in the uterus, the finger inserted, the position of the placenta ascertained, if possible; if not, the aperture is enlarged, the leg of the child is seized, and the child delivered feet first; the placenta is then sought for and removed, the uterus pulled down out of the wound, the elastic ligature tightened, and tied about the cervix; the knitting needles are passed through the flattened tube and through the uterus, forming a cross by two parallel bars to support the weight of the uterus and the stump, and to keep it outside of the wound; the peritoneum and the wound are closed down to the stump, as usual. The uterus is now removed close down to the needles and rubber tube, leaving a little tissue above; perchloride of iron is rubbed gently over the stump and the uterus is dressed with dry lint and gauze, an ordinary obstetric binder is put on, and the operation is finished.

Tait claims that this operation is better than Cæsarean section, and urges it in all cases where the mother's life is placed in danger.

REPEATED APPLICATION OF THE FORCEPS TO EFFECT ROTATION.

LOVIOT (*Bulletins et Mémoires de la Société Obstétricale et Gynécologique de Paris*, No. 11, 1889) reports the case of a multipara in whom the occiput was turned posteriorly, and in whom uterine contractions were not sufficient to rotate it forward; under the influence of repeated application of the forceps, a living child was easily delivered. He also reports the case of a primipara in whom the head rotated with the occiput posterior; attempts were made to turn the head anteriorly by the hand, but failed; the head was delivered by forceps, the child having died; at the time of delivery it was found that the shoulders of the child had not rotated, but remained as if in an occipito-anterior position.

BREECH PRESENTATION IN CONTRACTED PELVIS IN A PRIMIPARA. CEPHALIC VERSION, EXTRACTION OF A LIVING CHILD BY FORCEPS.

LOVIOT (*Bull. et Mém. de la Soc. Obstét. de Paris*, No. 11, 1889) describes the case of a primipara in whom breech presentation occurred at between eight and nine months pregnancy; the fœtus was gently pushed up in the uterus,

the patient being chloroformed, a cephalic version was made, the membranes were ruptured, and the head extracted with the forceps, the child being born alive.

He also adds the report of a case of right dorso-posterior position, in which rapid version was made, the parturient lying upon the right side; the patient was partly anæsthetized; the rapid extraction of the child was comparatively easy. Loviot regards the lateral position of the patient as most advantageous in such version.

PRACTICAL POINTS REGARDING CÆSAREAN SECTION.

SÄNGER (*Centralblatt für Gynäkologie*, No. 12, 1890) writes concerning the essential points in the modern Cæsarean section as improved by him. He regards the simplifying of the operation as of great importance. As a means of checking hemorrhage the careful suture of the uterus is of paramount importance; he regards the method of checking uterine hemorrhage which results from atony of the uterus by means of tampons of iodoform gauze as especially valuable, and raises the question whether it would not be proper to tampon the uterus with gauze at all Cæsarean sections before closing the uterus; he thinks that this precaution would render the cases where amputation of the uterus for hemorrhage is necessary much less frequent; in severe cases he would even have recourse to artificial inversion and extirpation of the uterus through the vagina. Regarding hemorrhage from the placenta, he much prefers to deal with the placenta when situated at the anterior uterine wall, as uterine incision anteriorly is less likely to be followed by adhesions and subsequent complications. At the moment of operation he considers pressure by the hands of a skilful assistant the best possible means of checking hemorrhage; it is difficult, however, to keep up pressure sufficiently long, and with sufficient vigor in all cases; he accordingly suggests the use of a piece of antiseptic muslin, shaped like a cravat, which he places about the lower uterine segment, crossed at one side, and then held firmly by the hand. A number of these cravats may be used about the edges of the abdominal wound, and can be held in place by hæmostatic forceps. He regards entire separation of the placenta and the free use of ergotin by injection as useful means of lessening hemorrhage, and especially cautions against operating before labor pains are well established, as the uterus does not contract properly in such cases, and uncontrollable hemorrhage is very apt to occur.

Regarding the antiseptics of the operation, his main reliance has been absolute cleanliness and the application of heat in cleansing the instruments and apparatus; antiseptics are useful externally, but should never be brought in contact with the peritoneum; iodoform is still employed to dust the uterine wound, not so much as an antiseptic as an agent lessening the formation of ptomaines.

It is his custom to seal the abdominal wound tightly by means of adhesive plaster.

Sänger concludes his observations (*Ibid.*, No. 13, 1890) by some considerations regarding the suture to be employed in Cæsarean section. He reasons that the tissues to be closed are composed of different varieties, and that it is

irrational to close them together by only one suture; he believes that the uterine muscle should be closed separately, and then the peritoneum drawn over. He considers silk the safest and most convenient material for suture, and regards the adhesions which frequently take place between the uterus and anterior abdominal wall to be dependent upon a lack of precaution which irritates the peritoneum through the application of antiseptics, too large knots in the suture employed by which the uterine wall is closed, and also a failure to close the peritoneum accurately, which leads to imperfect closing of the abdominal wall and the formation of adhesions: he would avoid this trouble by perfect asepsis instead of the use of antiseptics, and by a most scrupulously careful closure of the peritoneum separately.

THE SIMPLIFICATION OF THE METHOD OF PERFORMING CÆSAREAN SECTION.

LEOPOLD (*Archiv für Gynäkologie*, Band xxxvi. Heft 3) would simplify Cæsarean section as much as possible, believing that it is not necessary to avoid decidua in inserting the stitches; while holding that the serous suture is important, he does not believe that the serous suture is a safe preventative of hemorrhage, as in one of his cases fatal hemorrhage occurred through the tissues between two deep stitches over which serous stitches had been placed; he believes that an incision three and one-eighth inches long is generally sufficient, which can be closed by five or six deep and six or eight superficial sutures, the latter of which he would insert one-third of an inch deep.

In reply to Leopold, FRITSCH writes (*Centralblatt für Gynäkologie*, No. 13, 1890) denying that so small an incision as that recommended by Leopold is possible, reasoning that a child's head of a circumference of nearly eleven inches cannot be delivered through such an incision; he also claims that the serous suture is a most efficient preventer of hemorrhage, and he instances cases of his own where such has been the case.

A CONTRIBUTION TO THE STUDY OF PLACENTAL ADHESION.

COHNSTEIN (*Archiv für Gynäkologie*, Band xxxvi. Heft 3) has investigated the frequency of adherent placenta and operations necessary for its removal. He finds that obstetric operations for abortion, miscarriage, atony of the uterus, and stricture of the uterus, and other complications with the placenta, except adhesions, average $2\frac{1}{10}$ per cent. of all cases, while adherent placenta is a cause for operation in 0.46 of one per cent., while in polyclinic practice in 4.35 per cent. The safest way of diagnosing placental adhesion during the placental stage in labor consists in introducing the entire hand for examination; adherence is generally found at the fundus and anterior surface of the uterus; the most frequent cause of placental adhesion is inflammation of the endometrium caused by premature births, rapidly repeated pregnancies, infectious diseases, syphilis, and nephritis; placenta prævia also frequently results from adherent placenta; the best prophylactic treatment of adherent placenta is the prevention of chronic endometritis.

Some information can be obtained regarding the existence of adherent placenta by observing the degree of distention or the fluctuation wave existing in the vessels of the umbilical cord after it has been sutured and cut.

THE ACTION OF ANTIPYRIN UPON THE UTERUS DURING LABOR AND THE PUERPERAL STATE.

PINZANI, in an Italian pamphlet with the above title, describes a series of experiments upon patients with antipyrin during labor and the puerperal state; in therapeutic doses antipyrin depresses the contraction and retraction of the uterus; its effect commences half an hour after administration by the mouth, and attains its maximum during the two or three hours following; when given hypodermatically it acts in from half an hour to an hour and a half with maximum effect. Its action upon the uterus is felt soonest when administered early in labor in considerable doses; antipyrin diminishes the contractions of the uterus during the puerperal state, and also the pains caused by its contraction, whether in the puerperal state or during labor.

GYNECOLOGY.

UNDER THE CHARGE OF

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THE INFLUENCE OF "LA GRIFFE" UPON THE FEMALE SEXUAL ORGANS.

R. MÜLLER (*Centralblatt für Gynäkologie*, April 26, 1890) has made some interesting observations in this direction, his deductions being as follows: Out of forty-eight patients, forty-six showed positive evidences of uterine disturbance during an attack of influenza. The most prominent symptom was metrorrhagia, which resisted the ordinary means of treatment. On examination the uterus was found to be congested and tender to the touch. Patients with existing pelvic troubles invariably became worse.

ELEVATION OF THE PELVIS, ACCORDING TO TRENDELENBERG'S METHOD, DURING GYNCOLOGICAL OPERATIONS.

TRENDELENBERG (*Sammlung klin. Vorträge*, No. 355) describes his method of performing vaginal hysterectomy while the pelvis of the patient is elevated by an assistant supporting her knees over his shoulders, according to the method which he adopts when performing supra-pubic cystotomy. Vesico-vaginal fistulæ which are inaccessible with the patient in the ordinary position can be readily reached when she is in this posture.

INFECTION THROUGH CATGUT.

BRUNNER (*Beiträge zur Chirurgie*, Bd. vi. Heft 1) has found by experimenting with catgut prepared in various ways that the sublimated is always permanently sterile. About one-half of the specimens of chromocized, car-

bolized, and juniper-oil gut contain bacteria, though the latter do not seem to possess infectious properties. Gut was removed from an animal that had died of splenic fever and was introduced into the bodies of healthy animals, which speedily succumbed to the same disease; but when the raw gut was prepared with corrosive sublimate or carbolized oil it remained sterile. The following directions are given for preparing the catgut: The raw gut is scrubbed with alkaline soap, is immersed for a quarter of an hour in ether, then for twelve hours in a one to one thousand sublimate solution. It is preserved in a solution consisting of one part of corrosive sublimate, nine hundred parts of absolute alcohol, and one hundred parts of glycerin. Immediately before being used it should be dipped in the watery solution above mentioned.

COMPLETE PROCIDENTIA IN A NEWBORN INFANT.

QUISLING (*Norsk Mag. for Lægend.: Centralblatt für Gynäkologie*, April 26, 1890) reports the case of an infant seven days old who was attacked with diarrhœa accompanied by severe straining, which caused prolapse of the rectum and vagina. On the following day the uterus appeared at the vulva and became completely procident. It was easily replaced, but at once prolapsed and remained thus until the death of the child, which occurred six weeks later. As the autopsy showed no abnormality of the pelvic organs, the displacement must have been due purely to the excessive abdominal pressure. This case, the writer observes, throws some light on the etiology and treatment of prolapsus.

APOSTOLI'S METHOD.

SATONSKI (*Medicinische Rundschau*, 1889, No. 11) has met with the following results in thirty cases: In hydro- and hæmato-salpinx a current of 150 to 180 milliampères gave brilliant results, in pyosalpinx none whatever. In chronic oöphoritis a current of 160 to 220 milliampères caused reduction in the size of the diseased ovary and relief of the pain. 280 milliampères was the highest dosage employed in chronic metritis, under which the uterus became smaller and the pains were diminished. In amenorrhœa there were no results; in parametritis improvement. Though no definite results are given in the case of fibroids, it is stated that electricity should always be tried before advising an operation.

DISPLACEMENT OF THE SPLEEN INTO THE PELVIS.

KLEIN (*Münchener med. Wochenschrift*, 1889, No. 44) reports an autopsy in the case of a woman, æt. sixty-three, at which the enlarged spleen was found lying in the vesico-uterine pouch, the uterus being retroverted. A band the size of the thumb extended between the spleen and the greater curvature of the stomach. The liver, stomach, and transverse colon were also displaced downward. An ante-version pessary was found in the vagina supporting the spleen, so that the latter must have been mistaken for the fundus uteri—an error which occurred in a similar case reported by Dietl and Rezek.

VENTRO-FIXATION OF THE UTERUS.

SPAETH (*Deutsche med. Wochenschrift*, 1889, No. 37) reports fifteen cases in which this operation was performed by Prochownik, after palliative treatment had been long tried without results. Most of the various methods were employed. In all but one case the fundus uteri was found to be adherent to the anterior abdominal wall at the end of four weeks. Several of the patients had been under observation for months or years, and the result had been quite satisfactory. The adnexa were removed in all but five cases. Conception did not occur in a single instance.

PRAEGER (*Centralblatt für Gynäkologie*, April 19, 1890) reports four cases, one of which terminated fatally. Instead of using a pessary to support the uterus, after suspending the organ according to Sänger's method, he introduces an additional catgut suture through the fundus in order to relieve the traction on the other sutures while the patient lies upon her back. He believes with Dembowski that Leopold's method of freshening a surface on the anterior aspect of the fundus and bringing it in contact with the parietal peritoneum does not insure the formation of a firm adhesion; touching the peritoneum with the thermo-cautery would be a more efficient means. Catgut should not be used as a fixation-suture, as Czerny and Veit have advised. But no single method is applicable to every case, since it is sometimes impossible to draw the uterus up sufficiently to practise ventro-fixation; the organ must then be suspended, as Kelly has advised.

EXTIRPATION OF THE KIDNEY IN A CHILD THREE YEARS OF AGE.

DOERN (*Centralblatt für Gynäkologie*, April 19, 1890) reports a successful case of laparotomy for the removal of a large round-celled sarcoma of the kidney in a child. The patient was discharged four weeks after the operation and was perfectly well at the end of two months. Twenty-nine cases have been reported, with a mortality of 44.9 per cent. following the operation.

THE TREATMENT OF CICATRICAL STENOSIS OF THE VAGINA.

KÜSTNER (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Band xviii. Heft 2) calls attention to the fact that incision and stretching of cicatricial bands in the vagina are only curative in the less severe cases. Where there has been extensive loss of tissue, as the result of sloughing, a regular plastic operation must be performed. Credé recommended the taking of a flap from the labium majus, notwithstanding the fact that true skin is included in the vaginal wound. The writer describes a case of extreme stenosis of the vagina in which he excised the cicatricial tissue, and turned into the wound bits of mucous membrane taken from a freshly excised piece of human small intestine, which were sutured to the edge of the wound. These retained their vitality and united satisfactorily. Two flaps were subsequently added from the adjacent posterior vaginal wall. Though the vagina was still contracted, the cicatrix resulting from the plastic operations was more elastic than the old one, so that after another flap had been turned in, the vagina was so widened and deepened that coitus was possible. The writer advises the transplanta-

tion of a piece of fresh intestinal mucous membrane removed from some animal as a preliminary step after excising an extensive vaginal cicatrix, any subsequent defect being supplied by a flap taken from the adjacent vaginal wall.

THE TREATMENT OF CERVICAL CATARRH.

STRATZ (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Band xvii. Heft 2) reports the comparative results obtained by employing different methods of treatment in successive series of twenty-five cases. In the first series daily applications of a ten per cent. solution of chloride of zinc were used, the average number of applications being eighty. After the lapse of five months ten patients were not cured, and the other fifteen had a recurrence of the trouble within two or three months. In the second series a fifty per cent. solution of chloride of zinc was applied, the average number of applications in sixty days being twelve. Three patients were treated for six months without benefit; six were cured, and all the rest had a recurrence after a couple of months. Syphilitic patients responded promptly to the treatment. In neither series was there any unfavorable symptom.

The third series included many of the cases which had been treated unsuccessfully with the chloride of zinc applications. In every instance excision of the diseased mucous membrane, according to Schröder's method, was followed by a cure.

The fourth series were treated by applications of concentrated lactic acid, about ten being made in the course of fifty days. Ten patients were cured, two were not benefited, and the rest had a recurrence.

In conclusion the writer infers that the weak chloride of zinc solution is comparatively useless, the stronger solution and lactic acid give fair results, but that excision offers the only sure prospect of permanent cure in obstinate cases of chronic cervical catarrh.

VESICAL COMPLICATIONS IN CONNECTION WITH PELVIC AFFECTIONS.

LINDEMANN (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Band xxii. Heft 2) contributes an elaborate paper on this subject, its purpose being to call attention to the changes in the shape, size, and condition of the bladder occasioned by pelvic inflammatory processes and new-growths, and the importance of these changes in connection with surgical operations. In an introductory section on the normal anatomy of the bladder directions are given for estimating the size and relations of the viscus by introducing a catheter, and turning its point in various directions, so that it may be felt by the finger within the vagina. The vesical disturbances which accompany peri- and parametritis are only marked when the peri-vesical connective tissue is itself affected; the pressure of pelvic exudates alone is not usually sufficient to produce them. Traction upon the viscus by false bands causes vesical irritability, but the pressure of indurations upon the nerves supplying the bladder doubtless accounts for some of the symptoms. Neoplasms within the pelvis affect the bladder in two ways—by direct pressure, and by causing upward traction upon the cervix and vagina. The shape and relations of the organ are often greatly changed in consequence. In cancer of the cervix the bladder wall is early

involved, so that in a case which seems otherwise most favorable for vaginal hysterectomy, a radical operation is contra-indicated.

STERILITY.

LIER and ASCHER (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Band xvii. Heft 2) have made an exhaustive study of this subject, based upon upward of two hundred cases, selected from among 2500 married women under forty years of age, none of whom had been married less than a year and a half. 76 of the 227 applied on account of sterility. In 29 the apparent cause was slight (usually stenosis, a displacement, or simple cervical catarrh), in 31 there was either some congenital defect, gonorrhœa, or neoplasms. 46 husbands were examined, 21 of whom suffered from azoöspemia, 6 were practically impotent, and 5 had infected their wives with gonorrhœa soon after marriage; in other words, in seventy per cent. of the cases the male was unquestionably to blame. 151 sterile women applied for treatment on account of pelvic trouble, 79 of whom were suffering from some form of gonorrhœal infection. 86 husbands were examined, 21 of whom had azoöspemia. Of the 60 men who were healthy at the time of examination, 34 had wives whom they had infected soon after marriage.

A summary of the two series shows that of the 227 cases of sterility, 132 (58.1 per cent.) were directly due to the male. Among 424 cases collected from other sources, 169 (40 per cent.) were to be ascribed to either azoöspemia or gonorrhœal infection. As Säger has pointed out, the importance of gonorrhœa in its bearing upon vital statistics is emphasized by the foregoing observation, and its remote dangers cannot be overestimated.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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THE INFLUENZA.

From a public health point of view, the most important event in the medical history of the past year was undoubtedly the epidemic of influenza, which, entering Europe from the East early in October, had in the course of the next three months spread over every part of the Continent; whence, crossing the Atlantic and the Mediterranean, it reached Canada and the United States early in January, Northern Africa, Syria, and Persia somewhat later, and, finally, invaded the Cape and India in February, and the Australasian colonies and settlements in March.

The path of the epidemic in Europe and beyond it, shows conclusively that, like cholera, it followed the lines of human intercourse, and that consequently, whatever its original source, and the apparent capriciousness of its

incidence, it belongs to the class of contagia, and is not caused or carried by atmospheric or other meteorological conditions. Its course within the Continent of Europe was from east to west—*i. e.*, opposed to the direction of the prevailing winds at that season, but was modified or diverted by such physical obstacles as mountain ranges and the interposition of seas. Thus, while it took nearly six weeks to extend itself over Russia, its progress was much more rapid so soon as it reached Central and Western Europe, with their networks of railways and other facilities for intercommunication. In the first ten days of December it had spread over Poland, Germany, Austria, Sweden, and Denmark, in the next the Netherlands and France, and in the last Spain, Italy, England, the Balkan States, and, finally, Norway. It evidently did not reach the last-named country from Sweden, its course having been checked by the intervening mountains, but by means of communication with Denmark or with England. The Alps and the Carpathians, in like manner, delayed its progress, and in case of the Danubian countries, this diversion amounted to an actual reversal of its direction. From Italy and the Levant it continued its now easterly course through Egypt to Syria, Persia, and India, and thus while its first appearance in the eastern hemisphere was in Northern Asia, its last was in the south of the same Continent, there being absolutely no direct communication between Siberia and India. To America, the Cape, and Australia it was clearly carried by the great liners; but it has recently been elicited by a letter from the agents of the Church Missionary Society in British North America, that influenza was prevalent around the shores of Hudson Bay and in Saskatchewan as long ago as last May; if so, and if it passed thence to Siberia, it would seem to have performed a complete circuit of the globe on its reaching Canada and the States in January of the present year.

Again, were it carried by winds, the inhabitants of town and country would be equally and simultaneously affected by it in its march, whereas, we find that the large centres of population and commerce are the first to suffer, next the smaller towns, and the rural and isolated communities last, if at all. In towns men suffer more than women, and those who are most aggregated under the same roof—as soldiers, and clerks in the general post-offices and banks, workmen in factories, printing houses, and large places of business, are attacked, in the first instance, in greater numbers and more simultaneously than the general public; while in the country, farmers and others who congregate on market days suffer far more heavily than the shopkeeping class.

The number of deaths certified as due to influenza would give an utterly erroneous and inadequate estimate of the mortality caused directly or indirectly by this disease. In an important and interesting communication by DR. JACQUES BERTILLON, Chief of the Statistical Department of the Municipality of Paris, which he read before the Epidemiological Society of London, this was well shown. While the deaths returned as influenza were but 213, the general mortality of that city during December and January was in excess of the average by no less than 5500, an excess which could not be accounted for by any conditions of weather or any unusual prevalence of other epidemics. The deaths from pneumonia, bronchitis, and pleurisy were double the average, and an almost equal increase was observed in those from phthisis, organic lesions of the heart, diabetes, chronic diseases of the kidneys, etc.

The former group, or those of the organs of respiration, represented, undoubtedly, the complications and sequelæ following on attacks of influenza in which medical advice had not been sought for the primary attack, and the latter was constituted by cases in which the supervention of influenza on chronic diseases, caused or accelerated a fatal termination which would otherwise have been deferred for months or years. A like excess of the mortality from all or nearly all causes was seen in every country, and especially in the larger cities.

Although the resultant mortality has been thus greatly constituted by diseases of the respiratory organs, the present epidemic has been distinguished from previous ones, especially the last, in 1847, by the general absence or mildness of the catarrhal symptoms in the initial stage of the primary disease, which has in the majority of cases been of the "nervous" type, except in Russia, where the proportion of pulmonary or abdominal catarrhal forms has been larger than here or in other countries. WILTSCHUR, of Petersburg, observed that the number of consumptive patients attending the Obuchow Hospital was greatly increased during the epidemic, and that the supervention of influenza on phthisis materially modified the type of the primary disease. The patients were, for the most part, still well nourished. Cyanosis of the face and extremities was of frequent occurrence, with asthma, extreme weakness, high temperatures (40.5° to 41° C. = 104.9° to 105.8° F.), pulmonary hemorrhages and rapid progress of the lung disease, death occurring in many instances unexpectedly and suddenly, apparently from implication of the cardiac ganglia. Persons, too, who had not previously shown any signs of pulmonary weakness, not uncommonly developed, after an attack of influenza, tuberculosis of the most acute form—"galloping consumption."

All attempts to discover a specific or characteristic microbe of influenza have as yet been unsuccessful. The most expert bacteriologist and trustworthy observers, as Finkler, Klebs, Ribbert, Weichselbaum, etc., have constantly found the *diplococcus pneumoniae*, *streptococcus pyogenes*, and the *staphylococcus aureus*, all of which are common to every form of catarrhal and inflammatory disturbance of the respiratory organs.

MILK PRESERVATIVES.

Milk is obviously the most perishable article of food, and between the alternatives of finding himself run out before the evening, or having at closing a quantity of useless milk on his hands, the retail dealer's position is not an enviable one. He cannot, like the large dairy companies, always keeping a supply in excess of any possible demand, put each night's surplus through the separator, to provide the daily turnout of fresh butter, and dispose of the separated and still sweet "skim" milk early next morning to confectioners and bakers. One cannot, therefore, blame him if he yield to the temptations of unscrupulous speculators, whose advertisements appear in surprising numbers in the pages of the trade journals, and by means of "preservatives," endeavor, more or less successfully, to keep his surplus sweet till the next day, when he may either dispose of it to less fastidious customers, or add it to the general bulk—a dangerous practice from every point of view.

These preservatives cannot be composed of more than a very few sub-

stances, since they must fulfil the conditions of a practical absence of taste, color, odor, and poisonous properties. In fact, soda, bicarbonate of soda, lime, borax, boric acid, and salicylic acid exhaust the list of possible constituents.

Before putrefaction, common to all animal fluids, sets in, milk undergoes two characteristic changes, viz.: souring and curdling; the former, or the conversion of the milk sugar into lactic acid, is set up by the action of fungoid organisms, while the latter, or coagulation of the casein, is brought about mainly by the action of the acid, but also by that of some product of bacterial formation of the nature of rennet.

Souring and curdling are sensible indications of change, but changes of far graver character may go on in their absence, even as in the production of tyrotoxine without perceptible alteration of taste. The alkalies act by neutralizing the lactic acid as fast as it is formed, thus obviating the sour taste and delaying coagulation, but have no germicidal or antiseptic powers. Salicylic and boric acid are well known antiseptics, that is in sufficient concentration, while borax is supposed to combine the properties of both. That they are largely used, and would be more often detected if looked for, there can be no doubt; but, setting aside the question of their wholesomeness or effect on health in the small quantities in which they can be used, Drs. LAZARUS and BITTER, of the Hygienic Institute at Breslau, instituted a series of experiments to determine how far they fulfilled their ostensible purpose.¹ They experimented on sterilized and on raw milk, at high temperatures (95° F.), and at that of ordinarily hot weather (68°-72° F.), with bouillon cultures of several pathogenic microbes associated with gastro-intestinal disorders, including Koch's cholera bacillus, Emmerich's enteric bacillus, and the spirillum of Finkler and Prior, and observed the behavior of the ordinary saprophytes of milk alone or together with the pathogenic. The quantities of the several reagents employed were the maxima that could be added without giving a perceptible taste—or, of soda and its bicarbonate 3 grammes; of boric acid 1 to 2 grammes; of salicylic acid 0.75 gramme; of borax 4 grammes, and of lime 1.5 grammes. The flasks were kept at the ordinary temperature of excessively hot weather, when such preservatives would be most used, viz., 68° to 72° F., and the inoculations were made with the usual platinum hollowed needle, but occasionally heavier sowings and higher temperatures (95° F.) were employed. The procedures and precautions observed were such as are familiar to all bacteriologists, the sterilization being effected by exposing the tubes to steam for two or three hours, and the unsterilized milk being drawn direct from the previously cleansed udder into sterilized vessels and used as soon as possible. In every case gelatin cultures were made from the milk tubes at three, six, nine, twelve, and twenty-four hours after they had been prepared and placed in the thermostat, the results both as to the kind and number of the bacteria developed in the gelatin being evident on the second day.

The pathogenic microbes grew well in the sterilized milk, and set up acidity which did not appear in the control samples. Finkler-Prior's was most active in this respect, causing the milk to coagulate in twenty-four to forty-eight hours according to the temperature. In the case of the cholera bacillus this

¹ Zeitsch. f. Hyg., Bd. viii. p. 2, 1890.

acidity soon arrested the further development and ultimately caused the extinction of the microbes.

In non-sterilized milk this destruction of Koch's bacillus was very rapid, the natural souring aiding that produced by the microbe; and with the bacillus of enteric, though acidity played a part as shown by control experiments, the growth of saprophytes was the efficient cause of the extermination of the pathogenic microbe within two or three days.

The general results as to the effect of so-called preservatives were somewhat surprising. With soda, or its bicarbonate, though souring was delayed, coagulation was not, for the alkalies, so far from acting as germicides, favored the development of microbes, and the excessive formation of their "rennet-like" products compensated for the removal of the acid by fixation. The sole action of soda is, therefore, the neutralization of the lactic acid, and thereby the concealment, by withdrawing one evidence, though the earliest and most palpable, of the changes which go on unchecked if not actually intensified. Yet the extent to which it is used in Germany, and probably elsewhere, may be judged by the fact that it had been undoubtedly added in forty of sixty-four samples of milk examined by Dr. Lazarus in the intensely hot weather of the earlier half of August, 1888. Boric acid, though a valuable and non-irritating antiseptic in surgical practice, when employed in a concentrated solution, appeared in the proportions practicable in the milk trade to be illusory. Neither acidulation nor coagulation was delayed, and it was powerless alike against saprophytes and pathogenic microbes. These conclusions do not conflict with the late Prof. Barff's successes in preserving meat, fish, or even cream by means of "boroglyceride," for he used it in a concentrated form, and washed it out before serving up the articles of food thus preserved.

Borax and lime were equally useless, the latter acting like soda, the former perhaps a little better. Salicylic acid alone had any claim to be considered a preservative. It did not, when added to raw milk, delay acidulation much beyond the normal period, but coagulation was postponed for twenty-four to seventy-two hours. Its effect on saprophytes was very marked, gelatin cultures showing that at a temperature of 71.6° F. their development was checked from the beginning, and that in twenty-four hours they were extinct.

The cholera bacillus died out from sterilized milk in six to nine hours, and in raw milk even sooner; but since salicylic acid has little effect on the souring, it was not possible to say how much of this result was due to the salicylic and how much to the lactic acid; and with regard to the microbe most to be feared, that of enteric fever, the action of salicylic acid was unfortunately inappreciable. Dr. Lazarus having established its claim to be a preservative, discusses the question of how far its employment is justifiable. It has, indeed, been condemned in France, but entirely on theoretical grounds. No doubt its habitual use would be injurious, but that is precluded by its cost, and he comes to the conclusion that under exceptional circumstances, and when the milk cannot be boiled before any changes have set in, its employment might be really advantageous.

The readiest test for soda is that of Schmidt, and consists in the addition of a few drops of rosolic acid to a mixture of equal parts of milk and alcohol. If the milk be pure, the color produced will be a brownish-yellow; but if an alkali, alkaline earth, or a carbonate of either be present, the red color of the

reagent will be heightened from a rose to a crimson, according to the alkalinity of the solution. As little as 0.2 per cent. is easily detected, and the test is equally applicable to borax and lime. For boric acid there is no ready test, but salicylic acid betrays itself at once by striking a purple hue, like that of potassium permanganate, with a dilute solution of ferric chloride.

STERILIZED MILK.

In boiling milk we have a certain means of destroying any pathogenic microbes, and if performed before putrefactive processes, including souring, have commenced, of delaying these for a time. But the question whether the chemical, or rather physical, changes effected by boiling have any influence on its digestibility, is an important one in its bearings on infant-feeding. Some medical men advise that milk should always be boiled as a precaution against infection, and with a view to keeping it longer sweet; others are under the impression that its digestibility is impaired. We believe that such fears are absolutely groundless, for heat alone does not coagulate the casein, which is the least digestible constituent: it throws up a film of coagulated serum-albumen, which entangles some of the fat globules, and, perhaps, a little of the casein, but beyond the alteration in the flavor, which we need not take into account with infants, the only other change is that the casein when brought into contact with the gastric secretion forms a finer and more flocculent curd—a decided advantage. This we believe to be the reason why the best Swiss condensed milk agrees so well with young infants, especially those with more feeble digestions, resembling in this respect physically, though not chemically, that of the human female, and more than compensating for the excess of sugar.

Milk sterilized by Soxhlet's process—*i. e.*, fresh milk poured into flasks, exposed to heat in a steam or water bath, and corked while in a state of ebullition—has been employed with the best results for infants; and Scherff's milk, in tins hermetically sealed while boiling, has found a ready sale on yachts and ocean steamers, but the cost precludes its general use apart from the drawback of the change in flavor. Pasteur proposed heating the milk to 140° or 176° F., and then cooling it down to 46.5° F., the higher temperature being fatal to most fermentive microbes, and the cooling intended to avoid the multiplication while the milk retained its warmth of any that might have escaped. Thiel's apparatus is the best for this purpose. It consists of a copper cylinder with corrugated sides, a draw-off pipe and cock at the bottom, and a cover above. This is enclosed in a sheet-iron cylinder, leaving an inter-space about five centimetres (two inches) wide, and the whole encased in wood to hinder the loss of heat. Steam from a boiler is turned on into the space between the copper and iron cylinders, and the temperature regulated as indicated by a thermometer. The milk is run down the inner corrugated surface of the copper in a thin film, as in the refrigerators in general use in this country, and conducted thence to a cooling apparatus constructed on the same plan. The volume of milk admitted can be controlled, but its downward flow cannot, of course, be retarded, and any desired prolongation of heating must be effected by retaining the milk in the apparatus.

DR. BITTER experimented with 20 quarts of market milk at a time, varying the flow from a quart in 40 seconds to 100 seconds, and keeping the

temperature of the outflow at 158° or 167° F. The results were encouraging, in so far that the milk kept sweet at least thirty hours longer than samples of the same not so treated; but while a temperature of 167° F. did not wholly sterilize it, one of 158° F. altered the taste perceptibly, and consequently the process has not found favor with dairy farmers or dealers. Indeed, Dr. Bitter thinks that it would be an error to accustom the public to the boiled taste, as it would tend to open a door to other forms of falsification. Pasteurized milk kept twice as long when the churns or cans were also sterilized by steam. But while the complete sterilizing of milk on a large scale is obviously impracticable, the simple process of chilling it as soon as possible by means of a refrigerator, of which Lawrence's is the best, has a remarkable effect in delaying the souring. It is insisted on by all the large dairy companies in London, who obtain their supplies from the country at distances of one hundred miles, or even more. Such milk remains unchanged for at least twenty-four hours longer than that from even the best dairies round London which has not been chilled, and in which the early rising of the cream, the first indication of change, is commonly mistaken for greater richness. The agitation of milk run still warm into the churns, and transported from some distance by road or rail, is well known in the trade to cause rapid deterioration, but an extreme instance of this which occurred in America when all the residents in a hotel who partook of the evening "meal" suffered violent purging, vomiting, and even collapse, while those who had taken the morning's milk only did not, showed that other changes than that of souring may be thus set up. The milk in question had been conveyed eight miles along a rough road in the hottest hours of the day in an exceptionally hot season, and Professor Vaughan detected in it the alkaloid that he had originally discovered in some similarly poisonous cheese, and had consequently named tyrotoxine, supposing it to have been formed by some mould in the process of ripening.

NOTE TO CONTRIBUTORS.

My editorial connection with this Journal, which has extended over a period of more than twenty-one years, ceases with this issue. In taking leave of the contributors to its pages I desire to express to them one and all my deep appreciation of the value of their labors, which have so largely given to the Journal the reputation it enjoys, and my cordial thanks for the support they have with uniform kindness given me, which has greatly lightened my editorial task.

I. MINIS HAYS.

All communications intended for insertion in the Original Department of this Journal are only received with the distinct understanding that they are contributed exclusively to this Journal for publication. Gentlemen favoring us with their communications are considered to be bound in honor to a strict observance of this understanding.

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SOME DISORDERS OF SLEEP.¹

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WHEN dealing with organs or functions the physiology of which we, in a measure at least, comprehend, it becomes easy and pleasant to discuss their alterations from health; but as regards sleep we know little. The wildest theories have been entertained concerning it; and, after all, we are simply driven to believe that it is a state of the nerve-cells—and why not of the nerves?—in which they become functionally actionless in a variable degree. Whether this be true also of the other cell structures of the body we do not know; and sleep may be a universal function, as would seem reasonable to those who believe that plants sleep. It is sure, also, that the sleeping brain contains less blood, or it circulates less, than the brain awake, and this is the limit of what we know.

The disorders of sleep are many. I have found myself driven to choose among them, and I shall limit myself to a less known group to some members of which I was the first to call attention.

In 1876² I described several of the morbid states of sleep, and again wrote of them more freely in 1878.³ In 1882, in my lectures on "Nervous Disorders of Women," I dwelt at greater length on the symptoms in question, as well as on others which have been much discussed of late in the journals without notable additions of value.

In making choice of how I shall treat of sleep troubles I have been influenced somewhat by the fact that certain of these it has been my

¹ Read before the Association of American Physicians, May, 1890.

² Philadelphia Medical Reporter, 1876.

³ Virginia Medical Journal, 1878.

fortune to see and to study more than I have the better known phenomena of dreams, somnambulism, and the like.

The approach to the unconsciousness of slumber, and, too, the return from it to the world of volition, may be medically considered as part of sleep, and, as I shall show, these periods are often disturbed by certain very interesting symptoms.

As we are falling asleep the senses fall from guard in orderly and well-known succession—this interval I desire to label the *præ-dormitium*. When we begin to awaken, and the drowsied sentinels again resume their posts, there is a changeful time, during which the mind gradually regains possession of its powers—this interval I may call, in like fashion, the *post-dormitium*.

THE RELATION OF THE PRÆ-DORMITIUM TO INSANITY.—In the borderland of coming slumber, when we are not yet overwhelmed by its full power, the steadying contradictions of the external world are, in a measure, by degrees cut off, whilst the will still holds a slowly lessening rule. It has long been known to alienists that the *præ-dormitium* is apt to be invaded by hallucinations in those who are apt to become disturbed in mind. Every student of himself knows, too, what a fairy country for visions is this intermediate state. Since, in the well, it is the time for castle-building, it seems natural that, in the disordered, it should serve to foster dangerous hallucinations, and that, in rare instances, these should be limited to the period in question. Baillarger is the only author who has studied with any care the relation of the *præ-dormitium* to insanity. Of this he says :

“The organs of sense ceasing to transmit to us exterior impressions, the control of our ideas escapes us, and whatever rises appears, as it were, spontaneous; at times vague or confused fantastic forms succeed one another, and we have of it all but a half consciousness. At times more distinct forms appear, and we are present, as it were, at a strange spectacle in which we take no active share, but which leaves distinct traces on the mind. Any exterior intervening impression causes these visions to vanish. A sudden noise, or touch, or light awakens fully the senses, recalls attention, and these phantoms are effaced.”¹

“In a long series of interesting cases he shows that certain persons, otherwise still sound, are liable to have, between waking and sleep, hallucinations which long precede the outbreak of insanity. He describes instances of such hallucinations of sight and hearing as lasting from one to three years, and ending in grave mental disease. These were usually voices or visions fading when the eyes were opened. In one case there was something like the sense of a blow on the head, and then on the bed, but nothing comparable in this direction to the phenomena of sensory shocks to which I shall presently call your attention.

I have myself seen illustrations of the facts mentioned, and I speak

¹ Baillarger *Annales Méd. Psych.*, vols. v. and vi.

of them here because this is ground we rarely go over in our examinations of patients. It will possibly be found that valuable prognostic indications as to insanity may be gained by examination of the *præ-dormitium*.

Before passing on to other matters I may say that generally, as I have known them, these prodromes of insanity were connected with eye or ear alone. In but one case was olfaction concerned. I will content myself with a sketch of it:

CASE I.—Mrs. C., æt. forty, of a neurotic family, all liable to neuralgic headaches. One brother died of ataxia. Convulsions in infancy were common to all five brothers and sisters—none ending in epilepsy. Mrs. C., otherwise than as to headaches, well, had a fall which injured her nose. The shock resulted in persistent headache, without other cerebral trouble save complete loss of smell. Two years later she had, but only on going to sleep, a sense of horrible odors, which were fecal or animal, and most intense. This lasted several months, and then were added sounds of voices, which were at first vague, but at last accusative and soon were heard in the day. The case ended in melancholia, with delirium of persecution, during which the trouble as to smell passed away.

CASE II.—A. C., a clever lad, of exceptionably able and normal descent, became insane at eleven years of age, and was long maniacal and often homicidal. For some months before this outbreak—which was acute—he was troubled by seeing animals on his bed before he fell asleep. Opening his eyes routed them at once. The condition seemed to have none of the peculiarities of the night terrors of childhood.

I am tempted to add the brief notes of another lad's case, in which the same *præ-somnic* period was a time of singular disorder of mind. It is, of course, known to many of you that the bromides may in some persons (and notably in the young) occasion, like mercaptan, profound melancholy or maniacal tendencies, which in several instances in my experience have been homicidal, or at least madly destructive.

The lad in question, an epileptic, was said to become homicidal from bromides. I was sceptical enough to test the matter. About the seventh day of using full doses of lithium bromide the trouble showed itself in the *præ-somnic* time, as visions of himself killing other children. It annoyed him greatly, so that he strove to keep awake, but at last, tired of the unnatural effort, would fall asleep, with too brief an interval to allow of his being disturbed again. After several nights of like distress the homicidal tendency broke out in abrupt and dangerous violence during the daytime.

There are epileptic cases in which inhibition of fits causes homicidal explosions which cease when the fit comes on, and do not recur for a time, whether bromides are continuously used or not. In the lad's case the fits did not lessen the tendencies to destroy or injure others. These lasted as long as the bromides were given. I think Echeverria mentions like cases.

There exists also, I may say, a group of cases (not in the books) in which the borderland of sleep is haunted by hallucinations for weeks or years without their ending of necessity in mental disease. But it is quite impossible for me here at this time to dwell on these interesting cases, of which I have seen a few, and but a few. In no respect do they differ from the like cases reported by Baillarger in which insanity resulted, save in the fact that it did not. Voices were heard, or distressingly real visions seen during the *præ-dormitium* and at no other period. With time and due care these visions faded away. Two of the half-dozen I recall were hysterical women; two were men in busy affairs, and one, the worst, a woman of thirty-seven, was, I think, preserved from insanity by the loss of her ovaries.

The corresponding time, which comes after sleep and before full wakefulness, is also said by Baillarger to be troubled in some by hallucinations; but of this I have no experience, nor does he speak of it as common. Tuke also has reported cases.

There is yet another and stranger mental condition experienced, though rarely, in the *præ-dormitium*. This is a suddenly acquired and sometimes persistent sensation of fear or terror without any sensory hallucination. For our emotional states we have usually a cause, or at least think we have, but what I now describe is an emotion without known parentage. Children may exhibit this continuous fear some time after the scare of a dream, like the echo of an emotion the cause of which is over.

Sometimes in adults this lasting sense of alarm is the product of a dream. The victim awakens and continues even for hours to feel the fear to which his dream gave rise. He is wide awake; lights the lamp; reads, or tries to; but is still fear-haunted, reason as he may. The patient who is liable to this fear may also be subject to attacks of pure fear without a dream cause, and arising in the time between waking and slumber. He has then no dream. Of a sudden, whilst half awake, the man is afraid. It is pure fear, such as the insane have at times. I append a case from my first paper. In it were both forms of the trouble here mentioned. The case is given, as stated by the sufferer, a scholarly, much overworked man, with no obvious habits, hereditations, or disorders to explain his condition. He says:

"About the year 1871 I was troubled with what I understand to be 'night-terrors,' but unlike any I have been able to hear of. Upon retiring I could generally tell whether or not I should have this trouble during the night. These premonitions were: A difficulty in breathing, not being able to draw a full breath, owing, as to me it seemed, to some obstruction in the lungs; intense nervousness; turning from side to side.

"I would fall asleep and have vivid dreams, and almost always upon the same subject, the purport of which was, that after long absence from home I returned and found that some one dear to me had become idiotic.

"The most painful attack of this kind occurred in 1872. That night I

dreamed that after a long absence I returned, and, upon approaching the city, I saw upon a steamboat my aunt. She had become crazy in my absence and was under the charge of keepers. As I neared the boat to speak to her she leaped overboard and was drowned, and her body, with a fearful idiotic leer upon her face, floated past me so close that I could touch it. I awoke with a sudden start, trembling from head to foot; and, although in a moment I realized that it was but a dream, yet the feeling of terror, instead of leaving me, rather increased. I was obliged to rise, light the gas, and leave the room and remain for several hours in an adjoining one. I then returned to bed and slept until morning; but the next evening, when it came time to retire, the recollections of the past night were so vivid, and the intensity of the mental suffering so clearly before my mind, that I could not force myself to retire. My reason told me that this was a foolish feeling, and that I ought to conquer it. But after a severe struggle reason gave place to this undefinable feeling of terror. That night, and for several nights afterward, although I was not addicted to drinking, I drank strong liquor until my senses were clouded, and this I did intentionally, otherwise I could not have retired.

"During the day-time, when thinking over this fearful attack, I concluded if it were given me the choice between passing one such night and being deaf, blind, or lame for life, I should choose the latter; nay, I felt that even death itself would be preferable to such another night. I have never since experienced such intense suffering, but have passed through it many times in lighter forms.

"This fall (1875) it took a different turn. Upon retiring I was unable to keep my eyes closed, because the moment I closed them a feeling akin to fright would cause me to open them.

"This was like, but incomparably less than, the dream-evolved terror. Nevertheless, it was bad enough. It did not come if sitting up I closed my eyes, but to lie down and close them was often enough; or, if the emotion did not then arise, it seemed to burst upon me just as I was conscious that sleep was near. These attacks were the worst. I was afraid—and of nothing. No reasoning helped me. As I am by nature, despite my professional life, hardy and courageous, I was rather ashamed of being fearful of nothing, knowing that in battle I had had no more fear than others, and none that disturbed me.

"After tossing endlessly for hours, I would at last sleep for an hour or more with the sense of sleeping illy. If I had a bad bout, I sometimes awakened with my mind not clear, and feeling as if I needed effort to steady it."

Despite these alarming symptoms, this gentleman got well after a summer in camp in Maine.

Others have described to me this state of fear in the præ-somnic condition. Says one:

"I have had, like others, nightmare, but this comes over me while I am quite conscious, and, of this I am sure, whilst yet capable of mental analysis, and just pleasantly drowsing. I simply and abruptly realize that I am afraid. I feel it coming. I am not paralyzed, as by nightmares. I can move. If I fully sit up, it is over; but, if I delay to do so, and it catches me, it stays on for a minute or two after I am completely awake and master of myself. I sometimes lie still with open eyes and seek to know why I fear, or reason it over, but nothing relieves me. The fear goes by degrees, but if at once I lie down again and close my eyes it comes back."

Another mental state, somewhat akin to this last (for fear and anxiety are near akin), also occupies the præ-dormitium. It is always an associate of bad sleep, or of insomnia, and consists in a series of unreasonable fears and anxieties. I will let a sufferer tell his story as he wrote it for me.

He was fifty years old, of nervous, restless intelligence, anxious always, successful past the common, free from disease, endowed with a perfect stomach, and habitually insomniac. He called three hours a good sleep, and for years lived on this and an afternoon nap of an hour. Now and then, his restlessness got worse, and was the insomnia of over-vigilant and excited centres, which furnished a succession of anxieties, each in turn capable of inhibiting sleep. He says:

"This trouble haunts the time close to sleep. I lie down; am easy, and assured of sleep. Suddenly, I think, Is the gas turned off properly? I get up and look; return to bed; get up again, and so on. At last, I become anxious as to my son, aged six. Is he safe in bed? will he fall out? My wife goes to see, reassures me, and then I go myself, and go a dozen times. Next, it is the furnace, or the locks, or fear of fire, until, worn out, I am surprised by sleep. It seems as if this thing waits for me at the gates of sleep, and I can understand that just then one's fancies may run wild. But once awake, the thing goes on until I am ashamed of the demands made upon my wife, and, too, of my own folly. I know of others who have the same trouble, but never in the day season."

SLEEP-NUMBNESS. NOCTURNAL PARESIS OR PARALYSIS.—As sleep-numbness, this disorder has become familiar since I described it in February, 1876, and later more fully in my book in 1882. Since then, Dr Andrew H. Smith, in this country, and Dr. Saundby, in England, have written of it anew; the former as an undescribed neurosis, and the latter without full knowledge of what had already been written. Dr. Saundby thinks I appear to have recognized this condition, but is of the opinion that the name I gave—nocturnal hemiplegia—in view of the very temporary loss of power, is not very appropriate. In fact, I described pronounced cases chiefly, and their duration had nothing to do with the nomenclature.

In general, functional day-numbness (as I and others have described it), whether neurotic, anæmic, gouty, diabetic, atonic, or asthenic, is apt enough to repeat itself at night in sleep. But there are people who never have day-numbness, and who are, nevertheless, liable to awaken with this interesting neurosis.

Definitions of it do not admit of sharp boundaries. It may be local, transient, a slight numb feeling, a faint tingling of the fingers, of a leg, or of one side; or else it may be intense, and present us with paresis and real defects of the touch- and pain-sense. In another case it may show itself as an alarming monoplegia, or distinct hemiplegia, lasting a few moments, or growing worse during hours. Again, it may involve the whole body, but is then apt to be less severe than are the hemi- or monoplegic forms. Yet, are they all akin? I have seen several of them in one person; at this time slight numbness, and at that, hemiplegia, alarmingly positive, with marked loss of power and with lessened sensibility. For Dr. Andrew A. Smith, waking-numbness is a paræsthesia at the exit from sleep, and "in this," he says, "there is nothing

added, and nothing taken away." But these subjective states, which to-day are mere tingling or formication, may to-morrow deepen into the semblance of hemiplegia, with distinct loss of sensation. It is only a question of degree. The neurasthenic, the hysterical, the tobacco-poisoned, the gouty, the dyspeptic, are liable to awaken with numbness, tingling, dysæsthesia of a part, or of both hands, or of a side. It goes off in a few minutes. More rarely, there is distinct weakness of an arm or a side, with dysæsthesia, very rarely with complete loss of feeling. In every case where there is lessened or lost motility, the sense of touch is also interfered with. And so it is that we may have various degrees of disturbance from faint tingling to profound temporary dysæsthesia and defects of power from paresis up to a brief simulation of paralysis. Were the worst of these simulations to last, they would be grave enough, and, in fact, it does sometimes happen that such states as I describe may even deepen in intensity after the patient is fully awake. In some patients they recur night after night, attack both hands or both sides on successive nights, or occur at intervals for years. I may add that I have sometimes seen this symptom in men apparently vigorous, and that it also occurs, now and then, in those who have multiple cerebral aneurisms or endarteritis. I have seen it, too, over and over, in convalescent hemiplegics. They awaken with the palsy worse, a functional condition being for a time added to that which had an organic cause, or the sound side suffers, to their great alarm.

I give a physician's story of his attack :

"Excessive work, with double abuse of tobacco, had caused day-numbness, which troubled the ulnar territories most. One morning I awakened with transient numbness of the whole left hand with no true loss of touch. A week later, I had on awakening dysæsthesia, with pricking of the whole right side, including face and tongue. I arose, found leg and arm weak, examined sensation in the finger-tips and recognized the fact that with scissor-points applied to the finger-cushions, I could not be sure of them as two at one-third of an inch separation. I was about to send for a physician, when the sense of tingling becoming worse in the extremities, the dysæsthesia grew less, and in two hours I was as well as ever."

It is of interest that he soon after saw a case of waking-numbness in a tobacco-using patient, whom he confidently reassured, stating his own case. In fact, however, the patient owed his numbness to unrecognized diabetes, and it ended in gangrene.

The history of numbness in all its grades points to a central origin, but that it may arise otherwise is also clear. In some cases of neuritis I have seen night-numbness as a first, a transient, and a repeated symptom preceding the pain by several days.

Some years ago, whilst writing my book on *Nerve Lesions*, I froze my right ulnar nerve with alcohol at 0° F. For ten days afterward I had more or less discomfort, and even acute pain, but especially, several

times, a positive numbness of the ulnar territory with which I awakened. It passed off with friction in an hour, but was much worse than the occasional day-numbness, which my experiment created. Yet, for a time, it was purely a waking symptom and faded swiftly. The more profound examples of hemi-anæsthesia with paresis as post-somnic states are, I think, most apt to involve the right hemisphere. I recall no instance of aphasic accompaniments in the rarer left brain disturbances. In their varieties these symptoms probably represent functional irritations or inhibitions of quite various parts of the brain; unlike their hysteric related states, they are felt in the face as well as below it, and are clinically of kin to the functional anæsthesias and pareses of certain migraines.

In some cases, notably in hysteria, waking-numbness is associated with pain in the parts affected, or there are also paræsthetic expressions, as sense of constriction, elongation, etc. At times, the sensation resembles the filitious formication of aconite-poisoning.

In Dr. Ormerod's paper¹ on numbness (which is the best of the English essays) he speaks of the pain suffered by some of his cases, and as to this he is quite correct. In fact, there are those who awake with pain in arm or leg, or both, so intense as to make the accompanying numbness seem of little moment. Pain as an accompaniment is also mentioned by Sinkler, but not as being severe; whereas, it is in some instances of waking-numbness very great. I add two or three cases. The first, again that of a physician, I leave as he wrote it. He says:

"The preparative causes of my present state were excess in tobacco, and a practice which left me no rest. Then came a domestic calamity, and I broke down with distress in the occiput, and an amount of suddenly developed physical feebleness which annoyed me. I could not walk up three flights of stairs without resting. My heart became rapid—90 to 100; my temperature 97.4°, and at night 98°. I was struck, too, with the weakness of my bladder, the urine merely falling as it emerged. All this was in December. In February I began to have night-numbness, and would wake in the night with all four limbs numb. The worst attacks were those at waking in the morning late. Early in the night the symptoms were less notable, or else affected one limb only, or one side. At times it was mere tingling; at others, positive lessening of sensibility to touch and pain. When this was the case, the limbs were for a time parietic; on one occasion so much so that I fell on getting out of bed. The trouble has not lasted usually more than thirty minutes, but went with great tingling, as of a limb asleep, as is said. After March, I began at times to have numbness in daytime, but rarely so intense as to disturb feeling. The tingling occasionally affected my whole surface, and was apt to begin around the mouth."

In this case the symptoms were neurasthenic, and absolutely no other cause could be assigned for it. Recovery was complete. The next cases are from Dr. Féré,² and are certainly hysterical and of great interest.

¹ St. Bartholomew's Hospital Reports, 1832.

² Brain, October, 1889.

Nocturnal Paralysis.—Mrs. V. came to consult me, for the first time, at the Saltpêtrière on the 12th of January, 1885. She was accompanied by her mother, who was over sixty years of age, but still very agile, and looked much younger than she really was. The mother had a painful ovarian spot with slight anæsthesia on the left side. Although the menses had ceased nine years previously, she had been subject to migraine, with attacks of melancholia, and occasionally convulsive fits. The father, who had been a drunkard and profligate, had quitted the house twenty years before, and no one knew what had become of him. A brother of the father had died in prison while undergoing confinement for swindling. Mrs. V. had two sisters born after her. The one had died of convulsions connected with teething at the age of eighteen months; the other died of convulsions when only six months old.

"Mrs. V. had been a precocious child both physically and mentally. She had walked and spoken at a very early age, and had learned very rapidly at school. She has never had convulsions nor tic, but from the age of six has suffered from frequent migraine, followed by vomiting, and during her whole life her sleep has been troubled by nocturnal terrors and nightmare. Menses began when she was twelve. At the age of seventeen she had attacks of chorea in consequence of worry. This lasted three months, and chiefly affected the left side. At nineteen she was married, and had her first child, a boy, when twenty-three. This child died of convulsions on the eighth day. In the following year she was delivered of a child stillborn. During her pregnancy she had anorexia and vomiting, which ceased spontaneously in the fourth month.

"Since her chorea Mrs. V. has always enjoyed good health, and has had no distinctive nervous outbreaks until about three years ago. At the time her husband died she suffered severe pecuniary loss. This induced insomnia, followed by loss of appetite and emaciation. By hard work her health became pretty good. About two months ago she had a very abundant metrorrhage. A few days after this mishap she began to feel constrictive pains in the head, extending over the whole of the cranium, but predominating in the postero-inferior region, which appeared, moreover, to be the seat of a constant pressure. From time to time she heard a cracking noise in the back part of the neck, which resounded in the occipital region of the skull. At nightfall she was seized by painful fancies, of ruin for her mother and her daughter, of illness for all her friends; at the same time she was a prey to unusual pusillanimity and indecision. Her sleep was disturbed by dreadful nightmares. She was widely awake toward six in the morning, but was incapable of making any movement. She suffered from distention of the bladder, but could not even think of getting up. Her limbs seemed numb to her, and as if wrapped in cotton. She appeared to know the position of her extremities only, and it seemed to her as if the greater part of each limb was wanting, and her hands and feet had been brought up close to her body. The sensation is analogous to that experienced by amputated persons, who say they feel only the extremity of the absent limb. She could make no movement whatever. When daylight was admitted a sensation of numbness and pricking gradually appeared in the extremities of the fingers and toes. These sensations, occasionally very painful, preceded the return of ability to move. About eight o'clock the patient could get out of bed, maintain herself in a standing position, and make movements of the arms. The complicated movements of the fingers, however, remained almost impossible. She was thus incapable of fastening her clothes, or of taking up a pin. When she had moved her arms and had been rubbed a little, her fingers became more supple. From the time she awoke until the nearly complete restoration of movement took in general about three hours. One day, when left in a dark room until about ten o'clock, she was found in the same helpless condition. Movements of the head and neck and of articulation were not affected. On examination no modification of the external aspect of the limbs could be determined. She suffered pain in the region of the left ovary, and had slight anæsthesia on the

same side. The contraction of the field of vision was tolerably extensive, and the patient was insensible to violet rays in the left eye. The iris of the left eye is of a deeper brown, and the pupil not so large as on the other side. Under the influence of bitters, iron, bromide of potassium and hydrotherapy combined with static electricity, all these symptoms disappeared in the space of three weeks, with the exception of pain over the ovary and the hemi-anæsthesia."

Case of Mrs. P. She complained of sudden shocks in the head which awoke her abruptly. These occurred by night four or five times. Finally came other troubles which raised her inquietude to a climax. When her sleep became broken, toward four or five o'clock in the morning, she found that she could not move any of her limbs. This general helplessness did not last very long, for after a few minutes of effort she recovered power of movement in her right hand and foot, but for the limbs on the left side prolonged friction was necessary. This paresis was accompanied chiefly on the left side by a sensation of painful numbness and pricking. The hand especially was quite cold, and the fingers appeared to diminish in volume, the rings hanging quite loosely.

This helplessness, which at first persisted only a few minutes, was in a month's time prolonged for an hour or more. The patient could not raise herself out of bed until some one had opened the windows widely and rubbed her energetically. Even then she would remain for many hours incapable of making any delicate movements or even of simply fastening her dress. When the paralysis was at its maximum the patient declared that she was no longer conscious of the existence of her own body, that she was, to use her own words, a *pur esprit*.

Under the influence of cold douches repeated twice a day at regular hours and a tonic treatment of iron, nux vomica, and arsenic, with bromide of potassium given every evening in moderate doses—one to three grammes—her condition rapidly improved. The paralytic numbness on waking diminished at once in duration and then in intensity. At the end of fifteen days it had almost completely vanished. The sensations of shocks in the head, which had caused the patient to awake, disappeared in turn. The anorexia and pains resisted longer; at the end of six weeks the pain in the tendo-Achillis still persisted, but in time it too disappeared.

It is very clear that a vast range of disease or disorder seems capable of causing night-palsy in its variety of degree. As concerns the cause, there is difference of opinion, from those who look upon it as due to rare somnic phases of the vessels of the brain to those who see in it, like Féré,¹ a deficiency of physiological excitation—"paralysis from irritation." Reflex it surely is at times, and local or peripheral rarely.

As to treatment, it is folly to discuss it. It means anything from the treatment of neurosis to that of gout, renal insufficiency, diabetes, and what not.

SLEEP-PTOSIS.—Another form of annoyance to which I have time to give but a passing notice is the ptosis of sleep. Of this I nowhere find mention. The patient awakens with palsied lids; lifted, they fall again. In some instances it lasts a few minutes or longer, or else before the disorder repairs itself sleep returns, and at morning the patient has it anew, or awakens without it.

I append two cases which came under the care of Dr. de Schweinitz:

¹ Brain, October, 1882.

One was that of a woman, aged sixty-five years, as I understand in good health and not hysterical. There was some irritation of the lids and slight general conjunctivitis, also there was a slowly ripening double cataract. As the vision was still fairly good she read much, and if she used her eyes freely in the evening was sure to experience the following trouble: waking in the night, she found that her eyes could not be opened by the will. After they were forcibly opened they remained controllable by volition until after sleeping again, when the same phenomena recurred.

The notes are not complete, and although she describes the ptosis as spastic, it seems to me to have been only a night-palsy, of temporary duration. A somewhat similar case was observed at my clinic a few weeks ago, and I have seen a number of them :

J. C., aged twenty-nine years, a widow, was in absolute health after a childless marriage of four years. Soon after her husband's death she began to suffer with sexual dreams, and later, with these and hemi-anæsthesia of decisive type without loss of power. A year from the beginning of her widowhood she awakened thrice in one night with paralysis of the lids. There were no eye troubles, but the lids as she awakened could not be lifted at will. When raised by a finger they fell flaccid, and only by degrees, in an hour, recovered tone. This trouble, unknown to the day, continued for many months, and, indeed, disappeared only when this and all the other symptoms were promptly dispersed by a second marriage.

In another case the ptosis was like the emotional spastic ptosis of hysteria we see in waking hours, and well known to neurologists :

A woman, aged sixty-seven years, in good general health, but full of notions; for fourteen years has been the subject of stubborn retinal asthenopia; the eye-grounds are, however, healthy; there is a considerable degree of hypermetropia and astigmatism, together with insufficiency of the internal straight muscles. Each night, for a long time, usually between twelve and two, she has been awakened over and over by a feeling that her eyes have closed spasmodically. She arises, forces them open with difficulty, and bathes them, "because the lids feel as if they were sticky and would glue fast." The phenomena repeat themselves, but never by day.

This case proved, I believe, very obstinate, and is only notable because it is of nocturnal origin alone.

SLEEP PAIN.—I add a few words as to what is, for rarity, a medical curiosity. I find on my note-book some half-dozen cases of pain in the legs, never known to the day, and needing sleep as a conditioning factor. Whenever I have spoken to a patient of this obscure disorder he is apt, if intelligent, to say: "No, not pain; it is distress." It occurs in middle life, or later, and, without previous disease, comes on slowly. In one case it followed a typhoid fever. The cases are alike. A man is well in the day; walks, works, does as do others. Some time after he falls asleep he is awakened by aching in the legs, from the sole half-way to the knees. There is but one remedy—motion. He rises, walks for ten

minutes, is eased, goes to sleep, and in an hour or two awakens to feel the distress and repeat the relieving exercise. There is no unusual heat or cold; nor any abnormal appearance. The matter is unpleasantly simple, and there is no clue to a cause.

The case I now quote from my note-book I saw two years ago. It is typical of a rare condition :

J. C., aged fifty-eight years, farmer, Kentucky; married; two healthy children; himself of sound breed. Has worked hard, and has never known a serious illness. No malaria. In October, 1886, consulted me; I found him a man weighing 180 pounds; height six feet, vigorous, with soft arteries; heart beating seventy-six, and perfect. He has no piles, hernia, or varicose veins. Eats well; is in all ways moderate and regular; does not smoke, and does not chew tobacco. All the reflexes are normal; the heart and arterial tension healthy. No organ is diseased; can work all day; no tenderness in nerve tracts.

About four years ago he began to wake now and then with distress in the legs. During the next year this got worse, and now is a source of extreme suffering and of disability, because of the loss of sleep it causes. Within an hour after bedtime he awakens in what he calls torment. From the knee to the toe his legs ache, without throb or sharp pain. He rises, walks until weary, goes to bed, sleeps, and wakes to the same pain or distress. Again walks, and so on, until day brings relief.

At the infirmary we learned that in the attacks the legs remain normal as to temperature, reflexes, and electrical conditions, as well as to sensation. No remedies were of the least use, except morphine, and I advised its steady use in despair as to other means.

SENSORY SHOCKS.—Another phenomenon of sleep, or its borders, and also in the sensory sphere, I first described as sensory shocks or discharges.¹ This is a more rare, but also a more interesting disorder, than numbness. Except my own paper and a small book by a homœopathic practitioner,² I know of no literature on the subject beyond a few lines of remark on my paper in an essay of Hughlings Jackson's. Nevertheless, the subject is still of interest.

All the disturbing phenomena of sleep at some time represent themselves, more or less well, in our waking hours. But sensory shocks are, of all disorders of sleep, the most rare in daytime.

In the præ-somnic state of fading sensation, but never on waking from sleep, the patient has in his head a sudden and violent sensation, and the forms it assumes may be classified thus :

I. *In the sphere of general sensation.*—He feels as if struck, or as if he had a shock like that which a sudden arrest of motion causes; or, it is

¹ Virginia Medical Journal, op. cit. Lectures on Nervous Diseases, op. cit.

² In Dr. W. S. Searle's book he described sleep shocks as a neurosis, hitherto unmentioned in medicine, and was evidently unaware that I had already and fully delineated its peculiarities.

a feeling of rending, or a bolt driven through the head. These are the most common.

II. *Auditory*.—A loud noise, like that of a pistol-shot, or of the crash of broken glass, or as of a bell, or a wire sharply twanged.

III. *Visual*.—A flash of light.

IV. *Olfactory*.—Sudden sense of an odor.

V. I doubtfully add what I call *emotional discharges*. These are always mere abrupt sense of fear, sometimes *preceding* the sensory shock, and sometimes *following*.

What happens is usually this: A man going to sleep, but still quite conscious, and able to observe, feels suddenly a shock in the head. It seems mechanical, as of a blow, or noise, or else of both; and, also, there may be added a flash of light, vivid or like the soft summer lightning along an evening horizon. The intensity of these phenomena may be appalling, and even those who are used to them greatly dread their return. The first experience is sometimes most alarming.

In many cases there is an aura. A physician, who came to me on account of these attacks, first called my attention to this. While waiting for sleep he became aware of an indescribable something, which rose from the feet and hands, and taking eight or ten seconds to reach the head, there ended in a sound like the crash of glass houses breaking in a hail-storm, with a vivid flash of yellow light, leaving him for a moment dazed, but able at once to rise, or to think. Such is the usual account given of this aura. It never varies, save that it may rise only from the belly.

All sufferers, or nearly all, who have aura, say they can stop the attack by turning over, or sitting up, or even by opening the eyes. A friend, who had this trouble owing to tobacco, says:

“The shocks were of two kinds; one as if I received in the brain a thump, and one as if a pistol-shot occurred in the head. I had for a long while no idea that the pleasant mistress, Nicotia, was disturbing my internal economy. At last, before learning this, I got used to these abnormal things, and would lie still and feel what you call the aura. By the way, it is not at all like an air, but like the surging upward of something more positive. When it gets to the neck I am gone; the explosion occurs. Below that I can avert the wretched thing, either by rising or rolling over, for it never comes except I be on my right side. No mental effort suffices to check it.”

I have notes of two males who suffer only if on the right side, but I have not always made inquiry as to this point.

The aura is said at times to be like a tingling, or else is described as an upward surge of indescribable nature, and at times only rises from the epigastrium. Often there is none. Once felt in any case, it usually continues in some form to precede all future attacks.

There is another form of warning, which patients only succeed in

describing as a state of brain which foretells the shock. I have heard this called a humming, or buzzing, within the head.

Hysterical women are often quite unable to stop the shocks, or the aura is too swift to be a timely warning. It is rare to find any grave result. A few people become vertiginous, but not severely. At first, alarm causes emotional scare and a quickened heart, and in some few, even when repetition has lessened the terror of the shocks, they cause a more prolonged palpitation of the heart. In a few minutes, when again sleep is near, comes another shock, or there are a number of slight attacks, as of a bell, or a guitar string twanged, and by degrees fading away; visual discharges less commonly recur in this manner.

I have over and over met with cases of sensory shock in the daytime, but only in the hysterical. In some few people they occur during sleep, and awaken the patient, but their habitual place is in the *prædormitium*.

All of these curious outbreaks represent, as a rule, the "coarse stuff" of sensory product, or something near it. There is sense of shock alone, or this in succession with noise or light, or both. The noise is rarely comparable, as to note of music, or as to a bell, or a string vibrating. And so also of the optic explosion. There is light, violet or pale yellow. No visions appear; no voice calls. It is "primary sensory stuff," and no more. In the one case connected with smell, the patient had an epigastric aura, and smelt bananas. She had anosmia.

These singular symptoms are found in some neurasthenics, in hysteria, and most often in men as a result of over-use of tobacco-smoking. I first knew of it in my own case, during an attack of neurasthenia, many years ago, and soon learned that it was immediately due to my cigar. I can assure you that one's first acquaintance with it is most terrifying. Bromides and strychnine control it, as I have elsewhere stated.

I pointed out years ago the interesting resemblance of these innocent attacks to epilepsy, and Hughlings Jackson has also noted the fact. Bennett,¹ in a paper on the "Sensory Auras of Epilepsy," describes cases in which the signal-aura consisted simply of crude sensation, such as tingle or pain, which he calls sensory epilepsy. These are sensory cortex centre explosions, with consciousness and without spasm.

Next to touch-aura in epilepsy comes most often optic-aura—sense of light, or definite color with form. In the *præsomnic* explosion the visual phenomena are still more crude than in these. But in epilepsy, auditory auras are rare, and gustatory and olfactory auras still more uncommon. Certainly, many epileptics who have auras at times experience these alone. The patient feels as if struck by a sharp blow, or perceives a noise in the head, or sees red fire, or a flash of light, and has

¹ *Lancet*, April, 1889.

no fit. Or else he has a subjective taste, or, like a physician I know smells human ordure for half an hour, and may fail to have the usual sequent spasms. These are very like such *præsomnic* shocks as give us in their completest form a sense of tingling, etc., which, rising, ends in a more abrupt sensory discharge, as of a sensation of shock, light, or sound, or these variously combined, as does also occur in epilepsy sometimes, as I have seen. Again, too, in the subjects of sleep-shocks are found those who have in the *præsomnic* state conditions of terror or daze, which are brief, and represent explosions in the intellectual or emotional sphere, like the dazed or dreaming states of some epileptics. And, curiously enough, this, too, may in our illustrative shocks be preceded by a sensory aura of one or two senses.

In epilepsy with auras we may have, first, an aura—*i.e.*, a sensory discharge, usually simple tingling, and then a sense of flash or sound, or of light and sound together; the centres being, one may notice, in juxtaposition.¹

In *præsomnic* discharges the discharge is simple, or preceded by tingling—true aura—vague epigastric sensations. The analogy to epilepsy is closer when, as often occurs, an uncontrollable jerk or flap of the whole body ends the attack. With motor centres pathologically over-excited, or capable of being morbidly overcharged, widespread epileptic motor phenomena may follow the sensory discharges, and in early cases of sensory explosions, hysterical convulsions of mild type may result, and thus bring us still more near to the sequential chain of epileptic conditions. On the other hand, epilepsy is not a disorder which haunts the *præsomnic* time. However close the apparent analogy, there must be a wide difference between it and these sensory explosions.

Lastly, there is a form, which I have seen but twice, in which we have an aura—a flash-shock or sound—and a sense of pain darting down the cervical spine, and then along both arms to the finger-ends.

SLEEP-JERKS. CHOREA.—In the motor sphere are certain disorders which trouble the sleep, or *præsomnic* state in hysteria or neurasthenia, and which are only distinguished from phenomena found in health by their excesses. We all have had the common experience of a sudden jerk of the body as we were falling asleep. This, in certain cases, is exaggerated as to degree and number, and is also found in the sleep. I have seen many cases in which, scores of times in each night, the sleeper was awakened by a violent motor discharge of every muscle at once. In others the jerks are of arms or legs only. Probably, what are known as “foot fidgets,” which oblige the sufferer to move in order to get rid of an ever-recurring sense of unease, are, too, of like parentage, and are to be seen in all degrees of intensity. I was lately consulted by a Western

¹ Angular Gyrus and Superior Temporo-sphenoidal Convolution.

banker, æt. forty-six, to appearance well. No organ was diseased. He had passed successfully through a time of great financial trouble, and in its midst his wife fell ill. After she recovered he began to be a poor sleeper, and exhibited in turn a variety of sleep troubles. He had a mild form of shock—*i.e.*, light and noise. Disuse of tobacco aided these and improved his sleep, but, somewhat later, he began to have jerking in sleep. An arm, or the leg, or the body was violently moved, so as to wake him up, and this, he declared, took place countless times in the night. Still later he lay awake with a horrible unease in the legs. He moved about and got ease. If he lay still, he had to move again.

These motor discharges at times assume, through their frequency and severity, such importance as to affect health by the destruction of sleep which they occasion. An instance is given in my book of a woman weighing two hundred pounds, who spent her nights in a series of motor explosions so vigorous as at times to break the bed-slats. She has told me that she believes herself to have had as many as a hundred in a night; the whole body moving violently in sleep with a jerk like the leaps of a dying fish.

A different form of unease is seen in children who nevertheless seem to be well. Their sleep remains unbroken, but they roll over, twist, turn, wriggle, and continue to do so for hours. Possibly they are dreaming, but of this there is often no evidence, and they are not affected in health by this extraordinary restlessness, which may remain as the habit of a year or more. I have over and over watched these little ones in a sleep which permitted them to roll over and bend the body and move the limbs, until it seemed scarcely possible that they could remain through it all in a state of slumber. A little pause might follow and then another period of nearly constant movement.

In adults the extreme of restlessness is very uncommon, and means more than in childhood. Of the hysterical sleepers much might be said, but in them this form of activity during sleep is seen at times.

In the singular ataxia of hysteria, which I described a few years ago, the early stages of the disorder are apt to exhibit on waking an ataxic condition, which becomes increasingly worse, and at last continues through the waking hours. More commonly the ataxia comes on by degrees, and only in the day.

Lastly, in relation to the motor sphere are the rare examples of chorea seen only for a time on waking from sleep, of which elsewhere I find no mention. As regards this, I may remark that some early ataxics, and some neurasthenics, are apt to be unsure of their movements for a little while after waking.

CHOREA IN THE POST-DORMITIUM.—A. B., aged fourteen years, menstruating regularly; somewhat anæmic, but in other respects healthy.

Last spring, in the month of March, she was attacked by a singular

form of chorea. She had this trouble at no time except in sleep and on waking from sleep; on either occasion it was in attacks which did not endure very long. Her mother, who frequently watched her in the night, said that three or four times in each night she became restless, kicked off the covers, and began to move her hands, slowly flexing or extending them until at last the arms also moving, a general choreal movement ensued, which, at the same time, affected the legs, arms, and body, but never the face. The attacks affected her almost always when she awoke from sleep, during the time she was suffering from this disorder. In the warm summer weather it disappeared. It has returned again recently. She has been under my care for some time, so that I have had an opportunity of seeing that she is a person in perfect health with no organic disease about her on which I can lay a finger. The attacks in the night are very rare, but she scarcely passes a morning without waking in this choreal condition. The spasm lasts from a half to three-quarters of an hour, and by degrees fades away. She apparently has no control over her movements, and in this respect they differ from ordinary choreas, except of the worst kind. This special manifestation of chorea must be extremely rare. In the experience of many years (in which I have seen a multitude of cases) I recall but three or four of this character. It is mostly confined to sleep, or to the awaking state, not apparently existing during the day. I have no hesitation, however, in classing it as chorea, because it readily yields to the treatment which is given to choreal cases, and because, in one instance, it occurred in a child who had had two previous attacks of chorea.

This instance is, perhaps, worth relating:

C. J., a clever little boy of about twelve years—not very strong, nor very active-minded; never rheumatic; heart normal; not very fond of out-door sports, and somewhat anæmic—was attacked one spring with chorea, from which after two months he recovered. The following spring he was attacked again; this attack lasted seven weeks, after which he again got well. The next spring it was replaced by the peculiar form of post-somnic chorea, of which I have spoken. He had absolutely no chorea during the day. He usually woke up about half-past seven in the morning with choreoid movements of the hands; both sides were alike affected. They were not in character like those of the girl mentioned above, and were more distinctly under control. For half an hour, however, he could not pick up anything without dropping it. What struck me with him, also, was that the face was not concerned in any way; nor did it affect either leg. Sensation did not appear to be affected, and he was relieved by the ordinary arsenical treatment and cold douches.

TONIC SPASM is another rare trouble born of slumber, and lasting after it. I quote the only cases my note-books afford:

Mr. J. C., aged forty-five years, merchant, had syphilis and distinct secondaries at the age of twenty-three years. Was well at the time of the malady about to be mentioned—that is, he had no perceptible organic trouble.

About four years ago he began in the early mornings to wake up with rigidity of the legs. This was so extreme that it was impossible for him

to bend the ankles or knees, or to elevate the knees at all. If they were lifted by another with difficulty, they fell slowly in extension. It was truly, therefore, a distinct tonic spasm. If at that time he had excess or defects of knee-jerk I cannot learn.

This state continued to show itself for over two years, occurring at intervals; sometimes taking place every morning for a week, then lapsing for a month, but never existing at other times than when he came out of sleep. If he woke up in the night he occasionally had this same condition; but this was far more rare. It was commonly a morning affliction, and lasted for a few minutes, or at most an hour.

After a certain length of time the symptoms disappeared, but, owing to a bout of drinking, they renewed themselves. Again he got well, and a period of two years elapsed without further trouble. He had begun to have vertigo, followed by difficulty in controlling his water, and this was followed by incoördination, and the entire range of ataxic troubles to which he is now a victim.

I quote another case as a still more remarkable example of rigidity developed in sleep and continuing for a time after waking:

The patient was a man in good circumstances, aged forty-five. He was in the habit occasionally of awakening in the middle of the night with rigidity of the legs. The limbs were violently extended, the feet being so completely flexed as to be straight with the line of the legs. It was almost impossible to lift the legs without lifting the whole trunk, so tightly were the muscles contracted and so rigid was the whole mass, including the intra-pelvic group. This did not seem to be due to anything in the way of specific disease, nor to bad habits. The man had no disease to which I could relate it, except that he had been for many years a dweller in the lower part of the city, and had had attacks of ague year after year, and one very severe attack of remittent fever. Beyond this there was nothing, and these symptoms had long since disappeared; neither spleen nor liver was enlarged; nor, at the time of the rigidity, was he suffering from any malarial difficulties. The kidneys, heart, and lungs were alike sound, and to this day I remain puzzled as to the causation of this very peculiar malady. I saw him several times, because he used frequently to ring me up in the night in order that I might witness this affection, which was painful from the intensity of the contraction of the muscles. I have heard him scream from what he described as "positive agony." Indeed, nothing relieved it except full hypodermics of morphine, under which, slowly, within a couple of hours, the muscles would relax, but always after an attack would remain extremely sore for days together. He finally ceased to suffer.

I have seen a disorder of the same kind, or something similar, in hysterical women, but even among them it is very rare, and it is not necessary for me to go into details. The state is merely an hysterical curiosity. I mention it to complete the list of peculiar cases which I select from the odds and ends of my note-books.

RESPIRATORY FAILURE IN SLEEP.—I conclude this study of "The Disorders of Sleep" by calling attention to one of very great interest. I believe that it has been described by the late Professor Samuel Jackson,

but I have been unable to find his paper, which is not in the catalogue of the Army Medical Library. I recall, however, hearing him speak of cases in his lectures.

Where, for some reason, the respiratory centres are diseased or disordered, a man may possess enough ganglionic energy to carry on breathing well, while the will can supplement the automatic activity of the lower centres. But in sleep, these being not quite competent, and volition off guard, there ensues a gradual failure of respiration, and the man awakens with a sense of impending suffocation. This is not to be confounded with the hysterical sleep symptom of sense of suffocation, which is probably closer to the phenomenon of nightmares, and is followed by, or associated with fear, and is soon lost on awakening.

In the cases I refer to, the symptom is sometimes a signal of dangerous meaning. I have met with it in extreme neurasthenia, but in worse forms in locomotor ataxia in its paralytic stage. I have never seen it in labio-glossal lingual paralysis, where it would seem likely to occur. In ataxia it may be due to sudden incompetence of laryngeal muscles, which are liable, late in ataxia, to become paralyzed. Usually, however, it seems to be a failure of the chest and diaphragmatic movements.

Mr. C., aged fifty-six years, had posterior sclerosis, but gave no evidence in the day of respiratory incompetence, although he was distinctly far in the paralytic state. When in deep sleep he began to breathe less and less deeply, and at last, for a few seconds, not to breathe at all. At this moment he moved, twitched, and at last awakened with evidences of commencing apnoea in the color of the lips, tongue, and nails.

When awake a few voluntary efforts to respire relieved him. These attacks became at last so frequent and perilous that a nurse sat by his bed and awakened him as soon as he began to breathe less and less deeply.

As time went on the trouble increased, and whenever he fell asleep respiration ceased abruptly. He was finally worn out with loss of sleep, and died suddenly in one of these onsets of respiratory failure. No post-mortem could be obtained.

I have seen two other cases, but none so remarkable as that I have briefly related. But on the morning after I wrote these lines I saw a case in an ataxic not yet in the paralytic stage. Just at the moment of falling asleep he feels a sense of suffocation, fails to respire, and in great alarm sits up. These attacks probably differ somewhat from those of sleep.

The type differs from that of the ordinary Cheyne-Stokes respiration, being merely, and only in sleep, a gradual failure to inhale—a less and less deep inspiration; but no sequence of rapid breaths ending in dyspnoea.

A STUDY OF THE PATHS OF SECONDARY DEGENERATION
IN A CASE OF INJURY OF THE CERVICAL SPINE.

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ALTHOUGH at first sight it might appear that one case of any given disease is like another, and, therefore, that isolated cases are hardly worth placing upon record, yet the one I propose to relate presented features that are not so common as to render them trite, and, at the same time, showed the incorrectness of statements which common acceptance has caused to be looked upon as facts. The subject of the results of spinal injuries has long occupied a large share of the attention of surgeons; and neurologists and anatomists have been much occupied of late in studying the upward and downward paths of the secondary degenerations which follow injuries of the spine, whether traumatic or the result of the processes of disease; for, beside the interest which always attaches to the study of pathology, it being an acknowledged fact that the more perfectly we understand the morbid processes of any disease the more competent we are to treat it, anatomists have learned that from a study of the course of the secondary degenerations they can best follow the paths of the nerve fibres from their origin in the brain to their final termination in skin, muscle, or elsewhere, according to what their special function may be.¹

Henry B., thirty-five years of age, a sailor by occupation, and born in England, was admitted to the surgical ward of the Pennsylvania Hospital August 20, 1888, and died September 15th of the same year. During heavy weather at sea, ten days before his admission, he was struck by a wave and dashed against the bulwarks, striking the back of the head and neck against the rail. It was found at once that he had lost all sensation and power of motion from the clavicles downward, and from the time of the accident he had retention of urine and incontinence of feces. When admitted to the hospital there was a large bed sore upon the back, entire loss of sensation below the clavicles, and abolition of the reflexes. Examination of the urine gave negative results. The temperature varied between 100° and $103\frac{3}{4}^{\circ}$. There were no marks of violence nor signs of fracture or luxation of the vertebrae. The treatment consisted of the administration of iodide of potassium, the use of a water-bed, and a poultice upon the chest. Even upon his admission there were some coarse mucous *râles* to be heard upon examination of the lungs, and this condition gradually increased until the lungs were full of *râles*,

¹ My most hearty thanks are due to Dr. Packard, my colleague at the Pennsylvania Hospital, who placed the case at my disposal and under whose charge the patient was while in the ward, and to Dr. W. D. Green, the resident physician, who made the post-mortem examination and prepared the history for me.

and he became unable to expel the mucus; abdominal tympany came on and he became comatose and died seemingly of heart-failure.

Post-mortem examination showed that there was neither luxation nor fracture of the spine, but a small extra-dural hemorrhage into the spinal canal at the level of the seventh cervical vertebra.

In regard to the condition of the cord it will be necessary to give some details of the methods employed for its examination and preparation for microscopical study. When first removed the dura mater was slit up upon both the anterior and posterior aspects to expose the pia and nerve-roots and the substance of the cord cut transversely at many points, the sections being made at intervals of from an inch to an inch and a half. Though it was then examined with ordinary care nothing abnormal was noticed, and it was placed in Müller's fluid for preservation and hardening. After the tissue had been a few weeks in the fluid, when removed for examination it was at once obvious that it presented marked evidence of disease. When the lower part of the cord was looked at, a fresh transverse section having been made, it was seen that the gray matter was stained of the yellow tint produced by Müller's fluid, and that the greater portion of the white matter had the usual greenish color, but there was in the antero-lateral region upon both sides a large spot which was roundish when the cord was looked at, as already stated in horizontal section. This area was of a yellow hue, the shade of color being as nearly as possible the same as that taken by the gray horns. Upon cutting across the cervical portion—and it must have been at about the level of the seventh vertebra, the precise relation of the parts to the vertebræ was unfortunately not preserved, the nerve substance was seen to have lost all apparent uniformity of geographical arrangement, no distinction between gray and white matter could be discovered. The cord when thus seen presented a surface somewhat rough and irregular—and was of an almost even dirty yellow color, presenting at no point the greenish shade which is taken by the white portion of normal spinal cord. At all points, the cord below this area was natural, so far as naked-eye appearances went, except for the irregularly round spot in the antero-lateral columns which was everywhere distinctly visible, extending down into the lumbar region, where it was perhaps more evident even than above, and for two comma-shaped spots of yellow in the postero-external columns (see Plate I., Fig. 2 a) in the upper dorsal section cut a short distance below the area of injury. Unfortunately but little of the cord above the position of disintegration was preserved, but what there was showed perfectly distinctly that the yellowish spot in the antero-lateral columns was absent, but that a portion (see Plate I., Fig. 1 a) of the posterior columns was of the same yellow color—thus showing ascending degeneration above the area of injury.

Pieces were taken for microscopical study from the region of destruc-

tion in the cervical portion; a short distance below this area in the upper dorsal portion; from the mid-dorsal, and from the lumbar region. Two sets of these were prepared, the one by the celloidin method and stained with Weigert's reagents, the other in paraffine and stained with carmine, and carmine and sulpho-indigotate of potash. A third set were prepared according to the method of Schultze, which has been described in the *American Monthly Microscopical Journal*, December, 1889, by Dr. George A. Piersol, who prepared these sections for me—the staining material being carminate of soda. Sections were also prepared and stained by the Schultze method of a piece of the cord, a very short distance above the area of degeneration, from the cervical enlargement. Teased preparations were also made both of tissue taken directly from Müller's fluid, and, after being stained in carminate of soda and these mounted, some in glycerin and some in balsam, of portions of the antero-lateral (crossed) pyramidal tract which had been carefully dissected out, and of the anterior white substance which was still healthy, for comparison.

It will probably be best to begin the description of the histological conditions observed with the disintegrated area, and afterward to consider the secondary degenerations passing up and down the cord.

The sections were taken as nearly as can be judged from about the region of the seventh cervical vertebra. The large artery at the edge anteriorly presented some thickening of the intima, which was more marked upon one side than the other; others at the posterior surface also showed moderate increase of thickness of intima from nuclear proliferation. Veins at the posterior surface presented evidence of inflammation, and one contained a well-organized laminated clot occluding its calibre. The greater portion of the tissue of the cord itself had undergone complete disorganization, but the extent of this and its geographical distribution will be better understood by an examination of Plate II., Fig. 1, than by any description. Toward the periphery anteriorly a thin fringe of tissue remains, and posteriorly the whole of the posterior columns—except a small portion (constituting perhaps one-sixteenth to one-eighth of the area) near the commissure and quite a large area of the lateral column—upon one side are in a condition quite or nearly normal. In both these areas the nerve-fibres can be readily distinguished, and even the axis-cylinders are sharply outlined and well defined. The rest of the tissue, including thus a small part of the anterior portion of the posterior columns and much the greater part of the anterior white substance, with the whole of the gray matter, is completely disorganized and is made up of the so-called fat-granule cells, swollen and distorted nerve-fibres, corpora amylacea, large nucleated cells staining very red with carmine, and much space, apparently empty, which was probably filled with colloid material or liquid, for if it had not been so the tissue

would have collapsed instead of hardening in Müller's fluid. At the junction of the uninjured tissue with the disintegrated portion everywhere there is a boundary layer of material, greater or less in extent, which stains very bright red with carmine, showing the condition of cell activity which is to be looked for at the periphery of areas undergoing any stage of the process of inflammation.

In order to facilitate and make clearer the description of what was observed in regard to the condition of the cord above and below the area of destruction which has been described, two sets of diagrams were made (see Plate I.). These represent, upon the one hand, the paths of degeneration as their outlines would have been described from a macroscopical examination of the tissue alone after it had been hardened in Müller's fluid—for, as has already been stated, no abnormality was noticed when the fresh cord was examined; and, upon the other, these same paths as outlined from a careful microscopical study of the state of the nerve-fibres and other elements made from very good sections cut and stained in several different ways and from teased preparations.

Sections made a short distance above the area of disintegration, which, as already stated, was at about the level of the seventh cervical vertebra, showed that the tissue was not anywhere in as good histological condition as that taken below that region and further away from the area of transverse myelitis. Though the greater part of the nerve-fibres were natural looking, there were at all portions of the cord at this level scattered fibres which were more or less degenerated. The position in which the fibres are in the best state of preservation is the lateral (crossed) pyramidal tracts. An examination of the two diagrams (Plate I.) gives the best understanding of the apparent geographical distribution, both macroscopical and microscopical, of the paths of secondary degeneration.

It is evident that the gross appearances are very misleading, but this matter will be discussed later. Microscopical examination shows that in this particular case the whole of the posterior columns had undergone some degeneration, the greater portion, and that toward the centre lying nearest to the commissure in particular, having been almost entirely destroyed, there being hardly any normal fibres remaining, while a rather narrow band at the posterior edge showed only a partial destruction of tissue, it consisting of nerves whose outlines were sharp and distinct, and many others showing partial destruction of the axis-cylinders, some of these being swollen or fatty, or, again, very granular looking and stained intensely red with carmine. Some of these latter were undoubtedly axis-cylinders, swollen, disintegrated, and inflamed, for in preparations that had been stained with carminate of soda and then teased out into shreds (see Plate II., Fig. 3) many nerve-fibres could be seen in which the axis-cylinders were very red, distorted to all sorts of

shapes, and granular. In places the irregular swellings were so great as to be as large as the diameter of the myelin sheath.

Toward the inner sides of the lateral (crossed) pyramidal tracts the areas of degeneration abutted directly against the posterior gray cornua, there being positively no band of healthy or even partially healthy tissue separating them.

In the anterior white columns, extending around at the periphery from the posterior gray cornua, well toward the anterior and involving the whole of the direct cerebellar tracts, and what Gowers describes as the antero-lateral ascending tracts, were upon either side belts of tissue which had undergone partial degeneration, the degree of change being about the same as that of the most posterior part of the posterior columns. The area occupied by the degeneration can be better understood from an examination of the diagram (Plate I.) than by any description. Almost directly opposite the lateral branch of the anterior gray cornua upon one side, the red stained spots that have been mentioned were larger and more numerous than anywhere else—their appearance is well represented in Plate II., Fig. 2—and the teased preparation (Plate II., Fig. 3) proves that they are changed axis-cylinders.

In the gray matter some of the large multipolar cells were seen to be round and granular in appearance and no branches could be seen, nor nuclei, while others, again, were sharp in outline, the nuclei distinct, and several branches remained attached to them; whether these appearances were due to disease or not cannot be positively stated.

In the sections from the upper dorsal cord a short distance below the area of transverse myelitis, and in those from the mid-dorsal and lumbar portions, the degeneration in the lateral (crossed) pyramidal tracts was very evident, and its appearance, as compared with the healthy tissue from the anterior portion, is most graphically shown in Plate III. The nerve-fibres are swollen, in many instances the axis-cylinders having disappeared, or again, they are distorted and irregular in outline, and a very marked feature is the overgrowth and increase of the neuroglia, which has, at the same time, lost much of its regularity of arrangement.

The strands seem to be irregularly thick, have lost their sharpness of outline, and no longer present the natural appearance of running in a regular radial manner inward from the pia mater from which they start. The diagrams (Plate I.) show better the areas of degeneration than any verbal description. It may be seen how different are the impressions of the geographical distribution of these areas to be derived from the microscopical and macroscopical appearances, which latter are very misleading. The large comma-shaped spots in the posterior columns in the sections taken from the upper dorsal portion do not appear upon microscopical examination as areas of degeneration at all, the only change which corresponds being a distinct, but not very great, increase of thick-

ness of the neuroglia, which is stained very red by carmine, and a separation of the fibres as if by effusion. A noticeable feature is, that in all the sections taken from below the area of destruction—to a slight degree in those from the upper dorsal region and markedly in the mid-dorsal and lumbar regions—in the posterior columns toward the commissure, the nerve-fibres, though in a good state of preservation, are very much separated as though by the effusion of some fluid or colloid material. This could not have been the result of any faulty technique, as it is plainly to be seen in sections prepared in three entirely different ways. In several of these sections cut below the area of transverse myelitis, there was a strong suspicion of the existence of slight degeneration in the anterior (direct) pyramidal tracts, but it was not absolutely certain, and, therefore, not figured in any of the diagrams. With reference to the extent of the degeneration of the lateral pyramidal tracts, an examination of the diagrams shows that, as their geographical relation was determined by microscopical study in the sections from the upper dorsal region, the direct cerebellar tracts were left untouched, and a little more than is commonly described as belonging to this region, for the bands of healthy tissue at the periphery extended well back to the posterior gray cornua, the degenerated matter nowhere coming in contact with the enveloping pia mater, while at the inner side the degeneration extended flatly up against the posterior gray cornua, leaving no healthy tissue in what is described by Gowers as the lateral limiting layers. In sections from the mid-dorsal region the areas of degeneration were closely parallel to those last described. In the lumbar region, however, the conditions differed markedly (see Plate I., Figs. 4 *a* and 4 *b*) both from those found in sections taken from portions of the cord above and from the macroscopical appearances. The areas of total degeneration were separated from both the periphery and the posterior gray cornua by bands in which some slight change had taken place, but in which the greater part of the fibres were still in a good state of preservation. The spinal nerves, where any of them are included in the sections, exhibit marked degeneration; the degree of this is greater in the sections from the lumbar and mid-dorsal regions than in those from the upper dorsal, though still unmistakable, even in the latter area. There are also large clear spaces between the bundles of fibres where the bloodvessels lie as though there had been distention of the lymph sheaths. The character of degeneration of these nerves presents a marked contrast with that in the cord itself, looking as though a mere shrinkage and wasting of the tissue had occurred as a consequence of disuse, very different from what is seen in the cord, which exhibits all the appearances of a more or less active inflammation—in brief, the one looks as if it was a secondary and remote consequence of something that had occurred far away, the other like an active process going on where

it is seen. A marked feature in the sections taken from these three regions below the area of transverse myelitis is, that the columns of degeneration in the lateral pyramidal tracts in the lumbar sections cover a much larger area than they do in the mid-dorsal, and fully as large as in the upper dorsal, this being contrary to what is said commonly to occur—that the areas of degeneration became progressively less as the region of original injury becomes more distant.

Peculiar interest, perhaps, attaches to this case, in that the use of the Schultze method of staining made it possible to study the paths of degeneration and their precise degree and geographical outlines with much more precision than would have been possible by older methods. The Weigert method and very good paraffine preparations stained with carmine, and carmine and sulpho-indigotate of potash, gave results far inferior to those obtained with the Schultze stain, carminate of soda.

The degree of degeneration was slight as compared with that commonly found in long-standing cases of tabes or other forms of spinal sclerosis, which the Weigert method demonstrates so beautifully. The Weigert method, so far as the study of transverse sections of the white substance of the spinal cord is concerned, depends upon the black or bluish-black color taken by the myelin sheaths, and this prevents in healthy tissue any accurate study of the state of the axis-cylinders, which are so closely surrounded by the dark-colored material that their outlines are not distinct. In old cases of spinal sclerosis the myelin, as well as the axis-cylinders, has disappeared or undergone so much change as to be no longer capable of giving the characteristic color; and, therefore, the method demonstrates most graphically the degenerated areas. In this case, though, the degenerative processes had not progressed so far, the man having lived about five weeks only after his injury, and the changes had taken place principally in the axis-cylinders, leaving the myelin still in sufficiently good condition to take the characteristic color; and therefore, though the changes were sufficiently great for the Weigert method to show plainly their presence, it entirely failed to reveal the geographical outlines and extent, as shown by the other preparations.

The question whether these secondary degenerations of the cord are inflammatory, is one which it would seem possible only to answer in the affirmative, if the definition of Burdon Sanderson of what constitutes inflammation be received. In his classical article,¹ he defines it as follows: "By the 'process of inflammation' I understand the succession of changes which occurs in a living tissue when it is injured, provided that the injury is not of such a degree as at once to destroy its structure and

¹ Holmes's Surgery, vol. v. page 729.

vitality. With reference to their origin, all inflammations may be comprised in two classes—extrinsic and intrinsic.”

This definition is very comprehensive, and would seem to be as good a one as the subject to be defined admits of; the prime difficulty, however, remains—which is, to decide in individual instances among the very long “succession of changes” which occurs, often extending in an unbroken line to regions far remote from the original seat of injury, at what point precisely to draw the line, and say, upon one side the changes are truly inflammatory, and on the other are secondary and non-inflammatory. Certainly no one would pretend to call paralysis of a limb an inflammation, though caused directly by some inflammation of the spine which produced at the original seat effects the inflammatory character of which no one would pretend to deny. In the individual case being dealt with, a careful examination of the nature of the changes which occurred seems to make it sufficiently clear that those in the spine itself were truly a part of the process of inflammation, while those outside of this tissue, beginning therefore with the spinal nerves, were secondary, and would be more correctly described as atrophic than inflammatory.

The difference of the appearances in the two positions is most striking, in the spine the axis-cylinders and sheaths being greatly and irregularly swollen (see Plates), as though from an active inflammatory process extending upward and downward from the original seat of injury throughout the cord, while the spinal nerves, when changed at all, are shrunk so as to be much reduced in size—as though they were merely dried up from disuse—none of the commonly accepted signs of inflammation being present. The process of change was an unbroken one, beginning at the seat of original injury as an active inflammation and extending upward—how far, unfortunately, cannot be known, as the condition of the brain was not studied—and downward through the cord to the spinal nerves, and doubtless much further if it had been sought for, with lessening intensity until it ceased to be any longer properly named an inflammation, but became an atrophy.

The fact is a curious one—and its cause will probably be learned in the future, perhaps from a careful study and fuller understanding of the circulation in the parts—that the change from inflammation to atrophy is quite abrupt, and that the line is at the point of separation of nerve from cord.

It will not be amiss once more to call attention to Plate II., Figs. 2 and 3, showing, as they do, such very great swelling of the axis-cylinders, and to recall to attention the fact that no condition in any wise parallel to this was found in the spinal nerves, which, although in the nature of things they must have undergone their changes later than those in the cord, exhibited only alteration which could be described as atrophic; and to emphasize the conclusion, which would seem a

necessary one, that the so-called secondary degenerations of the spinal cord are in truth more correctly to be described as direct extensions of inflammation.

What part of the changes at the seat of injury was due to the direct effect of the blow producing rupture, hemorrhage, and immediate destruction of the tissue, and how much to the disturbance of the circulation and consequent failure of nutrition, it is quite impossible to say, but it would seem certain that the disintegration instantaneously produced must have been very great, for there was absolute loss of function, as evidenced by the complete loss of sensation and motion from the instant that the blow was received.

So far as the ascending and descending secondary degenerations are concerned, a study of their geographical relations and extent—and a very correct understanding of these may be had from the diagrams—brings to light several features of interest. It may be premised that, though the paralysis was absolute from the reception of the injury, the transverse myelitis was not; a large part of the posterior columns was structurally little, or not at all, injured, and two bands of tissue in the anterior white substance (see Plate II., Fig. 1) also were made up of nerve-fibres natural in appearance. A most important point which the study of this case demonstrates is, that any deductions drawn from an examination of the macroscopic appearances alone would lead to very false conclusions with regard to the paths and extent of the secondary degeneration, though the naked-eye appearances of disease were so manifest, after the tissue had been in Müller's fluid, that they could not have been overlooked by anyone. It is in the highest degree likely—nay, almost certain—that in the past erroneous conclusions in regard to the paths of degeneration have been recorded, owing to observers having trusted to the gross appearances alone, and to the fact that by older methods of preparation and staining it was almost impossible to obtain sections which would show the condition of all the nerve-fibres throughout whole sections down to the minutest details, as by Schultze's method. Beyond question, it is difficult, or even impossible in some instances, to determine the presence or absence of disease by a naked-eye examination alone of fresh spinal cord. Soaking in Müller's fluid for a week or two will very likely bring to light diseased appearances which cannot fail to be recognized, but the study of this case demonstrates that if the color-changes thus produced be exclusively relied upon; and it be concluded that wherever the white substance stains of a yellow color instead of the greenish hue which is generally taken by healthy white matter, that such areas are degenerated, and all parts taking the greenish tinge are healthy, a grave error will be made. The diagrams (Plate I.) show, upon the one hand, the outlines of the yellow-staining spots in the white substance drawn from a naked-eye examina-

tion, and, upon the other, the actual areas occupied by degenerated nerve-fibres; the appearances presented, as is readily seen, do not by any means correspond. In the sections from the cervical swelling above the myelitis area (Plate I., Figs. 1 *a* and 1 *b*), the whole of the posterior columns was more or less degenerated, a narrow band at the peripheral portion being slightly so, while that toward the centre had undergone complete disintegration, very few axis-cylinders being distinguishable. This is, perhaps, no more than might have been looked for, as the section was cut so short a distance above the region of almost total destruction, and if other sections could have been had from regions still higher, it is likely that the degeneration might have been found confined to the postero-median (Goll's) column, as is said usually to take place.

The degeneration of the whole of the direct cerebellar tracts and of a portion, at least, of the antero-lateral ascending tracts (as described by Gowers), is what usually occurs in ascending degeneration, and, as has already been said, it was in about the area of junction of these two tracts that were found the largest number of the greatly swollen axis-cylinders; the disease process seeming here to be very fresh and active.

The diagram Plate I., Fig. 1 *a*, represents the area of degeneration, as shown by macroscopic examination alone, and it may be seen that it is misleading, as it makes it appear that there was no degeneration of the posterior portion of the posterior columns at all, and none of the anterior part of the postero-external, nor any of the direct cerebellar or antero-lateral ascending tracts.

Figs. 2 *a* and 2 *b* represent the appearances, macroscopical and from microscopic examination, below the region of destruction, being of the upper dorsal region. This, as represented in Fig. 2 *b*, shows that the degeneration was of the lateral pyramidal tracts and lateral limiting layers alone. The appearances, as studied macroscopically, are very different—it would seem as if (Plate I., Fig. 2 *a*) the lateral limiting layers had remained healthy, while the greater portion of the direct cerebellar tracts appeared to be involved by the degenerative process; further, there appeared two comma-shaped spots in the postero-external columns, which microscopic examination failed to demonstrate at all—the only change, as has already been stated, that was found in this area being a general separation of the nerve-fibres, as though by some effusion and overgrowth of the neuroglia. This comma-shaped downward degeneration is alluded to and figured by Gowers,¹ but by him is represented as being of much less extent than in my case. It is very strange, and at present inexplicable, that it should have appeared merely as a color change and that no degeneration of the fibres should have been found, but only a separation and connective tissue increase.

¹ Diseases of the Nervous System, vol. i. pages 118 and 120.

Plate I., Figs. 3 *a* and 3 *b* show that though macroscopically it appeared as if the column of degeneration extended externally directly up to the periphery, microscopic examination showed quite a wide band of tissue (the direct cerebellar tracts) which had remained healthy; the lateral limiting layers were involved.

In Plate I., Figs. 4 *a* and 4 *b*, quite a different appearance is presented: macroscopically, the degeneration seemed to extend to the periphery, but to leave the lateral limiting layer healthy; microscopic examination showed that the degeneration in truth occupied the whole area outside the posterior horns, but that at the centre it was great in degree, while the lateral limiting layers and direct cerebellar tracts, though degenerated, were so in a less degree. It is curious that nowhere was there any positive descending degeneration of the direct pyramidal tracts, though some of the sections presented appearances suspiciously like it, and, contrary to what is stated to be the usual condition, the degeneration in the lateral (crossed) pyramidal tracts did not become less in extent from above downward as the distance from the seat of injury became greater. On the contrary, the degenerated areas in the lumbar sections, besides being as large as they were higher up the cord, presented, if anything, a still greater degree of overgrowth of the neuroglia. It is worthy of note that sections prepared by the Weigert method, though they exhibited distinctly the presence of degeneration, did not outline its extent nor show the histological condition of the component parts very satisfactorily. This was probably due to the fact that it produces its effect by staining the nerve sheaths of a more or less dark color, thus necessarily concealing, to a greater or less extent, the outlines of the axis-cylinders.

In conclusion, it may be well to summarize the points of interest of the case, and to emphasize the lessons it teaches:

First. The use of the Schultze method of staining in addition to the older ones rendered possible a closer study and more complete understanding of the disease than could otherwise have been had.

Second. The suggestion that the changes in the cord would be more properly described as inflammatory than atrophic, as they are usually called, is worthy of notice and consideration. The condition of the bloodvessels described in the sections from the area of transverse myelitis, and that of the connective tissue elements would seem to bear this out.

Third. The enormous size of the axis-cylinders, greatest in the antero-lateral ascending tracts above the area of myelitis—a thing the Weigert method did not reveal, and which was only made plain by the Schultze stain, would seem to be one of the earliest changes to take place, the white substance of Schwann remaining apparently unaltered and the large axis-cylinders being in the midst of nerve-fibres apparently healthy.

Fourth. The question is an interesting one and at present entirely unanswerable: What portion of the changes at the area of myelitis was at once produced by the original violence, and how much came on afterward as a consequence of the hemorrhage and disturbance of the circulation and consequent failure of nutrition?

Fifth. The separation of the nerve-fibres in the posterior columns, apparently from interstitial effusion, is curious and worthy of attention. There can be no doubt, either, of its existence below the area of injury throughout the dorsal and in the lumbar cord, for it was plainly evident in sections prepared in three different ways, and cannot, therefore, justly be attributed to any fault in technique.

Sixth. It is worthy of reiteration that the columns of degeneration, contrary to what seems to be universally accepted as always the case, did not become smaller from above downward, for they were larger in the sections from the lumbar than from the mid-dorsal region.

Seventh. The fact that the actual paths of degeneration, as outlined by careful study of the microscopical condition of the tissue, were so different from the areas occupied by the color-changes, the only guide to their understanding macroscopically, is a most important one.

Eighth. It is noticeable, too, that the paths of degeneration do not occupy and confine themselves strictly to the areas usually described. This proves either that the ordinary descriptions are somewhat incorrect, or that there is much variability of each case from every other one.

Ninth. The absence of any degeneration of the nerve-fibres in the areas occupied by the comma-shaped yellow spots in the sections from the upper dorsal region is not easy to explain.

Tenth. In considering the paths of upward degeneration it is curious that the whole of the posterior columns should have been involved, when it is recollected that in the region of greatest destruction, the posterior columns were the portion in the best state of preservation, the nerve-fibres being destroyed only in a very small portion of the front part. This does not tally very well with the doctrine that the change is a degenerative one, and that the disease creeps along the nerve-fibres in the direction of their function.

Eleventh. From the surgical aspect the case is interesting, especially in connection with the question of railway injuries, as demonstrating how complete may be the destruction of the nerve tissues without any bone lesion whatever, whether luxation or fracture.

DESCRIPTION OF PLATES.

PLATE I., $\times 4$ diameters. In Figs. 1, 2, 3, 4 *a* the areas covered with dots are the degenerated regions as determined from microscopical examination alone, the dotted areas being the portions of the white matter which had a yellowish color, instead of green like the healthy portion of the white matter. On the other hand, and in strong contrast, Figs. 1, 2, 3, 4 *b* represent the true areas of degeneration as determined by careful microscopical examination of sections.

Fig. 1 *a*. Cervical portion, above the area of transverse myelitis. The dotted area represents the ascending degeneration as determined by the color changes produced after soaking in Müller's fluid. It occupies the posterior columns alone, and of them leaves untouched the whole of the posterior portion next the periphery, and most of the anterior portion of the postero-external columns.

Fig. 1 *b*. Same region as Fig. 1 *a*, but the dotted areas here represent the ascending degeneration as outlined by careful microscopical study of sections. The heavier dots represent much degenerated regions, the lighter dots those less so. The whole of the posterior columns is degenerated, the anterior portion more so than the posterior, and degeneration extends around at the sides in the antero-lateral columns, occupying the regions called the direct cerebellar and the antero-lateral ascending tracts.

Fig. 2 *a*. Upper dorsal portion, below the area of transverse myelitis. The dotted portions are the regions of descending degeneration as outlined from the gross appearance after soaking in Müller's fluid. There are the comma-shaped spots in the posterior columns and degeneration of the crossed pyramidal tracts. The macroscopic examination made it appear that the lateral limiting layers were not involved, while the degeneration did not occupy all, or nearly all, of the direct cerebellar tracts.

Fig. 2 *b*. Same region as Fig. 2 *a*, but the dotted areas representing the descending degeneration as determined by microscopical study of sections. The crossed pyramidal tracts involved together with the lateral limiting layers, while the direct cerebellar tracts were free from change. No degeneration of the posterior columns.

Fig. 3 *a*. Mid-dorsal region. The descending degeneration here as outlined from the gross appearances seems to occupy the crossed pyramidal tracts and to extend flatly up against both the periphery and the posterior gray horns, and occupying, therefore, both the lateral limiting layers and the direct cerebellar tracts, if the latter extend so far posteriorly in this region.

Fig. 3 *b*. Same region as Fig. 3 *a*. The descending degeneration as mapped out from microscopical examination. It exists in the crossed pyramidal tracts and lateral limiting layers alone. As there is a wide portion of healthy tissue between the column of degeneration and the periphery, the direct cerebellar tract was certainly not involved.

Fig. 4 *a*. Lumbar region. The degeneration here, as determined from examination of the color changes, seems to occupy the crossed pyramidal tracts and to extend quite up to the periphery externally, but to leave the lateral limiting layers uninvolved.

Fig. 4 *b*. Same region as Fig. 4 *a*. The descending degeneration as outlined from microscopical examination. There is here a central column of greatly degenerated tissue (represented by the heavier dots) surrounded at both sides and posteriorly by a less degenerated portion (represented by the lighter dots), which fills up the whole of that portion of the antero-lateral white substance lying between the periphery externally and the posterior horns internally. This column of degeneration is much more extensive than is the one in the dorsal region (see Fig. 3 *b*).

PLATE II.

Fig. 1, $\times 10$ diameters, stained with borax carmine. The region of transverse myelitis. The tissue almost all destroyed except about half of the posterior portion of the posterior columns and a band of the antero-lateral white substance at the posterior edge, and a still narrower one at the anterior edge upon the right hand in the picture.

Fig. 2, \times about 400 diameters, stained with carminate of soda. Taken from the cervical portion above the region of transverse myelitis. The picture shows greatly swollen axis-cylinders (the large black spots), and was taken from the antero-lateral white column near the periphery of the cord at about the junction of the direct cerebellar tract with the antero-lateral ascending tract.

Fig. 3, $\times 400$ diameters, stained with carminate of soda, and the tissue teased to isolate single nerve fibres. The picture shows a nerve sheath and axis-cylinder, the latter irregularly swollen and granular in appearance. This was from the crossed pyramidal tract in the upper dorsal portion of the cord.

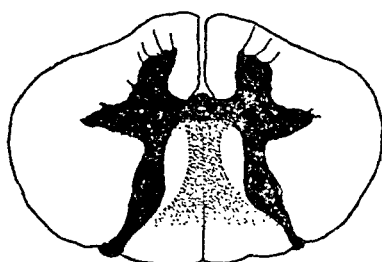
PLATE III.

Fig. 1, $\times 225$ diameters, stained with carminate of soda. This picture was taken from the anterior region (the anterior ground fibres) of a section of the upper dorsal portion of the cord, and shows the typically healthy appearance of the nerve fibres and connective tissue.

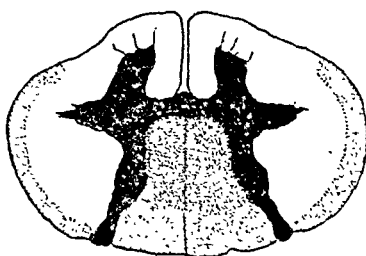
Fig. 2, $\times 225$ diameters, stained with carminate of soda. From the same section as Fig. 1, but a picture of the crossed pyramidal tract showing descending degeneration in a high degree of development. The axis-cylinders have in most places disappeared, and the arrangement of the connective tissue is distorted, having lost its radiating appearance. The contrast between these two pictures, which were taken from different regions of the same section, is a most striking demonstration of the more obvious differences in appearance between the healthy and diseased portions of tissue.

The pictures were all made by photographic process, and without retouching, from beautiful negatives made directly from the sections by Dr. George A. Piersol, except the diagrams (Plate I.) which was drawn by Dr. B. A. Randall, and Fig. 3, Plate II., which is a pen-sketch by Dr. Allen J. Smith. Without the assistance of these gentlemen to represent graphically what cannot be adequately described in words, my paper would have been almost valueless.

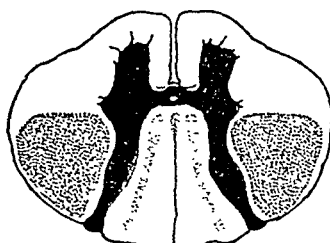
PLATE I.



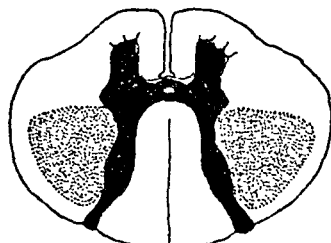
I a.



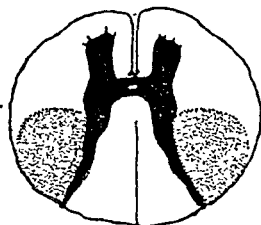
I b.



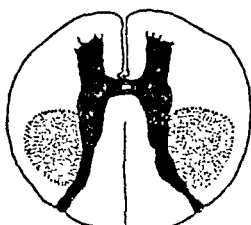
II a.



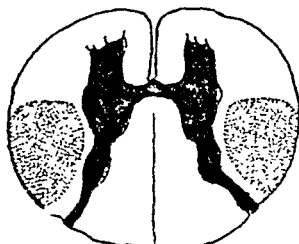
II b.



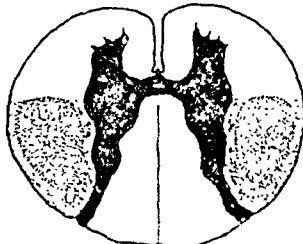
III a.



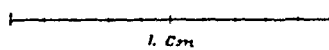
III b.



IV a.

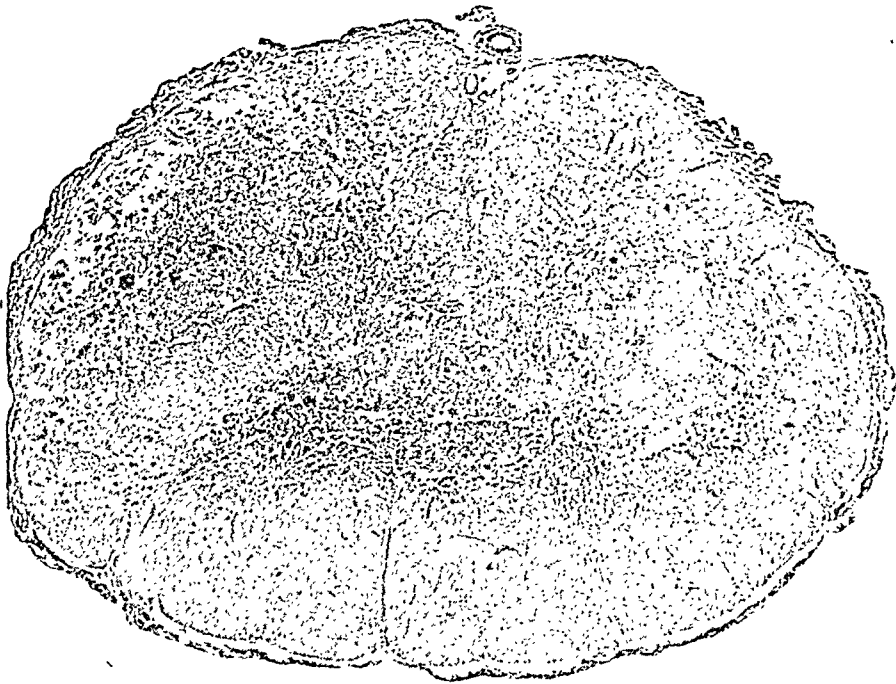


IV b.



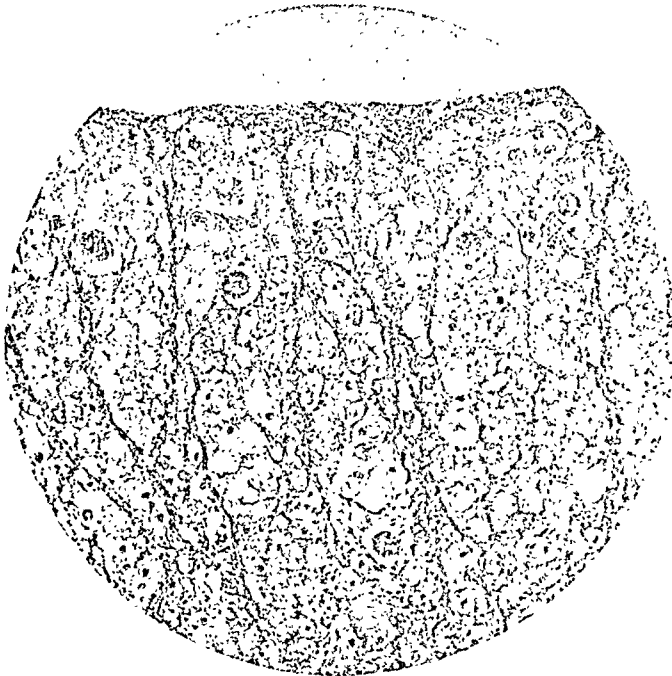
× 4 diameters.

FIG. 1.



× 10 diameters.

FIG. 2.



× about 400 diameters.

FIG. 3.

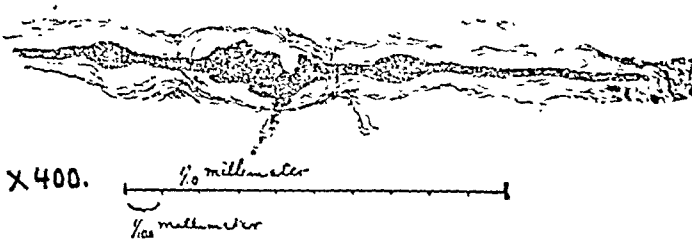
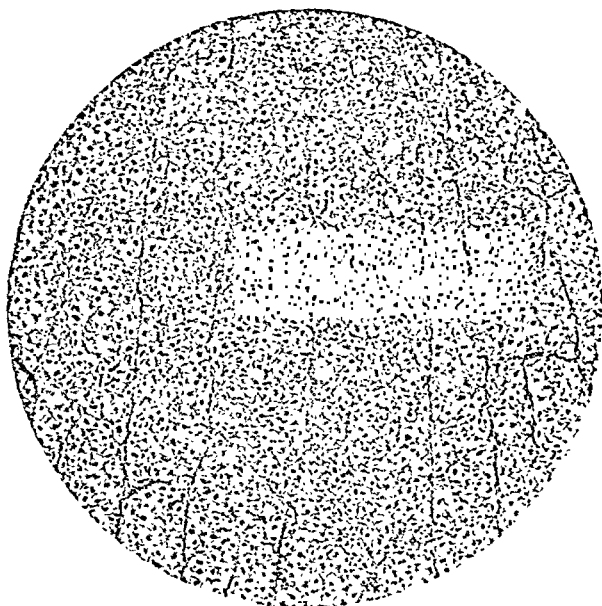


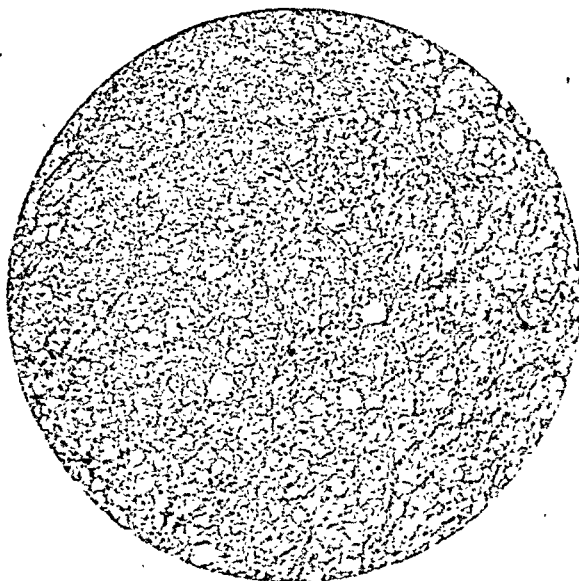
PLATE III.

FIG. 1.



× 225 diameters.

FIG. 2.



× 225 diameters.

AN INVESTIGATION INTO THE ETIOLOGY OF PHTHISIS.

BY HENEAGE GIBBES, M.D.,

PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF MICHIGAN ;

AND

E. L. SHURLY, M.D.,

PROFESSOR OF LARYNGOLOGY AND CLINICAL MEDICINE IN THE DETROIT COLLEGE OF MEDICINE.

V.

TUBERCULAR PERITONITIS.

BY HENEAGE GIBBES, M.D.,

THERE are some interesting points in this disease which deserve a short notice. In all the cases I have examined of tubercles in the omentum and mesentery the lesion consisted of an aggregation of small, round cells, generally surrounding a bloodvessel. Some of these nodules have a gray translucent appearance to the naked eye, and I have never been able to find any tubercle bacilli in them. Some, however, have a whitish opaque appearance, caused by the disintegration of their central portions ; in these I have invariably found tubercle bacilli.

I have made a number of experiments on animals by feeding and inoculation to see whether I could produce these conditions artificially, but I have found I could not rely on so doing by any one method, although I have produced them often. I have found the appearances presented were of two kinds :

1st. An immense number of small bodies, about the size of a millet-seed, studded the omentum and mesentery ; they were translucent, and on making sections of them and staining with logwood they were found to be collections of small round cells with a patent bloodvessel running through them.

2d. Numbers of rather larger bodies having a white opaque look and on section showing a number of similar small round cells at the periphery while the centre consisted of a granular débris resembling caseation.

In the first kind I have never been able to find any tubercle bacilli ; in the second they are almost always present, and generally in such numbers as to give a distinctly red appearance to the centre of the nodule. I have not been able to find any recorded account of reticular tubercles in this situation. In connection with this so-called tubercular peritonitis it is interesting to note the cases where laparotomy has been performed and has resulted in curing this condition. In several cases the abdomen has been opened under the impression that it contained an ovarian tumor. In one case, recorded by Sir Spencer Wells, the patient was alive and well twenty-two years afterward. Knaggs and Clarke, of Huddersfield,

have recorded similar cases, also Lawson Tait. These cases have, however, been open to the objection that it has never been proved they were actually tuberculosis—that is, the presence of tubercle bacilli had not been demonstrated. At the request of Dr. Bowditch the records of a case have been sent me by Dr. Henry O. Marcy, which remove this objection. The case is as follows :

November, 1886, a woman, *æt.* thirty, had been under observation in the hospital for some months, suffering from severe pain and emaciation, with uterus fixed. This was considered to be a case of old tubal disease. Dr. Marcy performed laparotomy and found disseminated tubercles in the mesentery and abdominal walls. A small portion was removed for examination. The abdominal cavity was washed out with a solution of bichloride of mercury 1 : 2000 and closed up. Examination showed the miliary tubercles in the portion removed to consist of colonies of tubercle bacilli, and this was confirmed by subsequent cultivation. Recovery followed with an improvement of all symptoms. In the following spring the patient sailed for Europe and in a letter dated August, 1887, she writes: "Am enjoying at present very good health, being able to work again."

This is, as far-as I am aware, the only case where an examination has been made for the tubercle bacilli. Since the above was written I have received a very interesting paper, by Dr. William Osler, on "Tubercular Peritonitis," in which is an account of a case where reticular tubercles were found by Dr. Councilman containing numerous tubercle bacilli and no caseation in the nodules. It however, agrees exactly with what I have found several times in artificial tuberculosis in animals where the mesentery and omentum have been affected. I have no doubt other cases will be recorded showing similar facts; in the meantime we have the evidence of one case that numerous nodules containing tubercle bacilli can exist in a serous membrane without setting up a condition of general tuberculosis. The cure of these cases by abdominal section in the present state of our knowledge seems very difficult to explain. Such a weak solution of mercury could hardly have any action on bacilli shut up in these nodules.

BOVINE TUBERCULOSIS.

By some authorities this disease is held to be identical with human tuberculosis—that is, by those who hold the view that tuberculosis is only such when the tubercle bacillus is present. Others consider the disease to be different in many respects, and extended observation obliges me to agree with their conclusions. In the first place, the ordinary chronic tuberculosis of cattle has nothing whatever in common with pulmonary phthisis in the human subject, except the presence of a bacillus which has the same chemical reaction to staining agents as the

tubercle bacillus of Koch. It has, however, many features similar to those in chronic tuberculosis in man, and also many marked differences.

On examining the lungs of a cow affected with tuberculosis the appearances presented under the microscope are those of reticular tubercle containing a large number of giant cells and also a number of large, so-called epithelioid cells; this reticular tissue is arranged round the margins of large caseous masses, which, in the majority of cases, has undergone calcification to a large extent. So far the disease resembles that found in the human lung, with the exception of the calcification, which, almost universally present in the bovine animal, is rare in the human. Another point, also, is the frequency with which large nodular masses are found in the pleura of cattle affected with this disease, which on examination are found to be composed of reticular tubercles. All these reticular tubercular formations consist of aggregations of small tubercles which appear to have grown and degenerated in a similar manner to that already described as occurring in the human subject.

So far the difference between the human and bovine disease is slight, and it is not until we treat sections of these lungs in a special manner to show the bacilli contained in them, that the difference becomes more marked. It is then seen that the bacillus itself differs in size from that found in human tuberculosis; it is much smaller. Klein (*Microorganisms and Disease*, 3d ed.) says they are nearly half, or at least one-third smaller. This may not seem an important point to many until they consider the extremely minute variations in shape and size which have been held, by some, to constitute a different species of microorganism and establish its connection with some form of disease.

The next point of difference is in the distribution of the bacilli, and here it is very marked. The bacilli are found principally in the giant cells and so-called epithelioid cells, and their arrangement in the giant cells is peculiar; they are arranged circularly round the periphery of each cell. The so-called epithelioid cells are packed full of them, and they can be found in clumps where these cells have broken down. I have before pointed out that bacilli are not found in the giant cells of tuberculosis in the human lung; at least, such is my experience and it is supported by other observers. We then have a difference in the bacillus itself morphologically and also in its distribution and relation to the component parts of the tubercular growth, from that of the bacillus found in the human lung, their only point of resemblance being their reaction to certain staining agents.

The next point to be considered is, Do they affect animals in a similar manner to those taken from human lungs when inoculated?

To settle this point I have made a large number of experiments both in feeding and inoculating animals with tubercular material obtained directly from the lungs of animals affected with tuberculosis.

The results I have obtained were the following. I will not give the experiments in detail, as they have been so numerous it would prove tedious.

The effect of the inoculation of guinea-pigs with bovine tubercular matter is to produce in them a general tuberculosis in which all organs are more or less affected. There are two points, however, worthy of notice.

I find throughout my P. M. notes of these cases, constantly occurring in the description of the microscopical appearances in the lungs and liver, the following remark: "The tubercular process seems to have commenced in the interlobular tissue and extended from it into the organ." Now this is exactly what I have found in many animals where this form of tuberculosis has occurred spontaneously, and it may have some significance. The second point is the freedom of the kidney from infection, and this applies to inoculation of human matter as well as bovine. I have never found the kidney affected except in those cases where pregnancy has allowed the disease to exist for a long time, months instead of weeks.

It must be understood that I am now speaking of the results of inoculation on guinea-pigs only.

In monkeys I have never seen the kidney affected from inoculation with human tubercular material from any source.

In inoculation experiments on rabbits with bovine tubercular material the results were very different. In every case a marked general tuberculosis was produced with large masses of caseation containing numerous bacilli. An important point in connection with these animals is this: in every case inoculated with bovine tubercular material the kidney shared the fate of the other organs and presented to the naked eye a surface studded with tubercular projections, which on examination proved to be caseous and full of bacilli.

There is still another point of difference between human and bovine tuberculosis which may have some significance in the further line of investigation we are carrying on, which will be the subject of future reports.

I have mentioned before the fact that after eighteen years in spirit the tubercle bacilli in the human lung still retain their characteristic reaction. In the cow's lung, hardened in the same manner, I have found that four or five years in spirit entirely removes this property and I cannot get any reaction from the bacilli. This, at any rate, is the case in several different specimens under observation.

I think from the foregoing facts it will be granted that the morphological difference in the bacilli and the marked difference shown by rabbits when inoculated with tubercular matter from these two diseases, justify us in considering that in the present state of our knowledge

they cannot be classed as the same, the only identical point being the reaction of the bacillus to staining agents.

Klein, in his work on *Microörganisms and Disease*, third edition, 1886, says, page 170 :

"According to my own experience, extending over a very large number of cases of humaniliary tuberculosis and tuberculosis in cattle, I cannot for a moment accept the statement that the bacilli found in the two affections are identical; for I find that in the two diseases their morphological characters and distribution are very different. The bacilli of human tuberculosis are conspicuously larger than those of the tuberculosis of cattle, and in many instances more regularly granular. . . . The bacilli in the tuberculous deposits of cattle are always contained in the cells; the larger the cell the more numerous the bacilli."

DIFFERENT ANIMALS IN WHICH BACILLI HAVE BEEN FOUND GIVING THE REACTION OF KOCH'S TUBERCLE BACILLUS.

I have examined a number of animals that died with diseases of the lungs and other organs and have found in them bacilli that give the characteristic reaction of the tubercle bacilli, although the lesions in many cases differ from those found in either human or bovine tuberculosis; and it may help in some degree toward the elucidation of the problem we are working at to give an account of these cases.

MONKEYS.—It is a commonly received idea that the quadrumana are very subject to tuberculosis. This is not the case; the majority of these animals that die in confinement are the subjects of bronchitis, bronchopneumonia, acute pneumonia, pulmonary phthisis, or pleurisy. In 1883 in conjunction with Mr. J. B. Sutton, I examined the lungs of a number of monkeys that died at the Zoölogical Gardens, and out of this large number only five were considered tuberculous. At that time I made the diagnosis of tuberculosis more from the presence of tubercle bacilli than from the actual microscopical appearances; extended observation since has made me very doubtful if a *bona fide* case of reticular tubercle ever occurs in any of the quadrumana. I have had several of these animals that have died from general tuberculosis as it appeared to the naked eye, cases where tubercles existed in every organ, where the omentum and mesentery were filled by them and immensely thickened, but careful examination has shown that in every one of these cases there was no reticular formation, only caseous degeneration of inflammatory products, and in this degeneration were large numbers of bacilli giving the reaction of Koch's tubercle bacillus.

It is impossible to tell what these cases really are without a microscopical examination. I have lately examined the lungs of a monkey that had to the naked eye every appearance of tuberculosis. On hardening them, however, all these apparent tubercles had disappeared, and on making sections I found they were caused by a localized emphysema

brought on by minute emboli. In a paper read by me at the Pathological Society of London, January 15, 1884, I described a similar case occurring in a *Beatrix antelope*.

CARNIVORA (*Viverridæ, Felidæ*).—Amongst the animals belonging to these groups examined were *felis eyra*, *paradoxure*, civet cat.

They had been fed on birds that were supposed to have died of tuberculosis. The changes found were in the liver, a portion of the organ had undergone caseation seemingly after some inflammatory condition; there was no appearance of reticular formation, and bacilli giving the tubercular reaction were found in the caseated portions.

URSIDÆ (*Coatimondi, Bears*).—These are the only animals, other than ruminants, I have examined where there was any resemblance in the morbid process to that seen in bovine tuberculosis. In the lungs there were large masses of changed substance which consisted of a fibroid tissue with, in some cases, giant cells and numbers of the so-called epithelioid cells. These latter contained many tubercle bacilli. One bear had nodular growths in the pleuræ.

CAMEL.—I have examined the lungs of a camel supposed to be tuberculous. The case, however, was one of acute pneumonia the consolidation of which had not undergone resolution but had remained in patches throughout the lungs. The outline of the air-vesicles could be clearly made out in the consolidated portions. Tubercle bacilli were so numerous in these parts that they were easily visible with the naked eye as red patches, principally at the edges of the affected parts.

BIRDS.—I have examined a large number of birds that were considered to be the subjects of avian tuberculosis, amongst others the domestic fowl, turkey, grouse, golden pheasant, South American ostrich, emeu. The appearances presented by the organs of these varied exceedingly, and I shall have to separate the rhea or South American ostrich and the emeu from the others. The first specimen I received was the liver of a rhea sent me by Mr. J. B. Sutton. On making sections and staining them with logwood I found circumscribed areas surrounded by fibrous tissue containing a number of cells; these areas varied greatly in size and the larger ones had the centre filled with disintegrated cells. Outside these areas the liver structure was normal. On staining them for tubercle bacilli I found that these areas were made up of cells filled with bacilli giving the reaction of those found in phthisis. In the larger areas the cells had broken down and the bacilli were loose amongst the débris. Between the affected parts a few cells could be seen containing the bacilli, but the majority were perfectly normal.

Dr. Klein made a drawing from one of my specimens of this liver for his work on *Microorganisms and Disease*, and considers it to be leprosy. This to anyone who has worked on leprous tissue is manifestly wrong.

Since then I have examined the organs of two rhea and some emeu and have found in them the same appearances, but in these cases I was able to examine all the organs: the result showed that everywhere the relation of the bacillus to the tissue was the same; in the thyroid, the intestine, liver, etc., the various cells were full of bacilli in places, but they had exerted no influence on the surrounding cells, and only in exceptional cases had the irritation been sufficient to set up new fibrous formation round the affected cells. In the intestine, the appearance of the columnar epithelial cells crowded with these bacilli was very peculiar. In the grouse and pheasant (golden) the changes were very different; here the liver was the organ affected, and on staining sections with logwood here and there patches of large cells were seen: these patches were composed of cells that stained very differently both with logwood and methylene blue; those in the periphery took the stain well and showed one or more well-developed nuclei, while those toward and in the centre stained faintly or not at all.

For a long time I was puzzled to account for the origin of these cells, but after carefully examining a large number of sections from various cases, I was able to satisfy myself that they were simply liver cells that had become hypertrophied. On staining sections with special stains I found that those cells which had taken the logwood or blue stain well, contained no bacilli, while those that had stained faintly or not at all with logwood or blue, showed with the special stain several red bacilli, resembling the tubercle bacillus. That is, the normal cells contained no tubercle bacilli, only those that were undergoing degeneration. It was an interesting question as to where these seed-eating birds had obtained the infection and I made many careful investigations of their food and surroundings, the earth in their runs and the worms contained in the earth, to see if any bacilli were present, but I could find none in any way resembling the tubercle bacillus.

I have frequently found caseous masses in the liver of the domestic fowl which contained large numbers of bacilli staining similarly to the tubercle bacillus and resembling it somewhat in shape and size.

SNAKES.—I have examined the livers of several large snakes, such as boas and python, which had died of disease presumably from having been fed on tuberculous birds.

The appearances presented were somewhat similar to those found in the rhea and emeu; that is, the liver cells in certain patches were full of bacilli giving the characteristic reaction, and some of the larger of these patches were surrounded by a small amount of fibrous tissue evidently formed by the irritation set up. All the intermediary portions of the liver appeared to be normal. The majority of these cases I received from Mr. J. B. Sutton, whose numerous papers on comparative pathology

published in the *Transactions of the Pathological Society of London* are very valuable. I have also obtained several cases from sources in this country and England, but the supply is much too small for extended work.

VI.

CONCLUSIONS DRAWN FROM THE FIRST PORTION OF THE INVESTIGATION.

BY DRS. GIBBES AND SHURLY.

WE wish now to point out the deductions we have made from our investigations so far, and later on we shall give the results of a number of experiments now in progress, but which will take a considerable time before we can get reliable data from them.

We consider that tuberculosis and phthisis pulmonalis cannot be classed as the same disease clinically, and in this opinion we are undoubtedly upheld by the majority of men having large clinical experience; we also consider that the appearances presented by the lesions in the lungs after death are so different in these two diseases, that they are even more widely separated pathologically than clinically.

It seems to us, then, that the position held by the bacillary theorists may be summed up in this way: To use an optical simile, rays coming from points as widely separated as tuberculosis, phthisis pulmonalis, lupus, bovine tuberculosis, scrofula, converge and come to a focus at a point, the bacillus tuberculosis. Here they immediately diverge, and when they have proceeded far enough—that is, to the post-mortem examination, they are found to be of different kinds, but each has its own identity. Our observations lead us to doubt whether all these rays do pass through the same focal point.

We would suggest the following classification of diseases of the lungs in which consolidation occurs:

ACUTE MILIARY TUBERCULOSIS.—Of two kinds, differing clinically only in the occurrence in one kind of typhoid symptoms, causing it often to be mistaken for enteric fever. Differing, however, *in toto* in the morbid histology, the one form being genuine tubercle, the other a collection of numerous small foci of inflammatory action.

Differing also in the distribution of Koch's tubercle bacilli, which in the latter form are always found in large numbers, but in the former are often absent and never numerous.

GENERAL TUBERCULOSIS.—The clinical features varying according to the chronicity of the disease, but sufficient to a careful observer to distinguish it from phthisis pulmonalis, and never following broncho-pneu-

monia. Differing in its morbid histology, in that the consolidation is always formed by new growth, and not by inflammatory action, this new growth being characterized by its proneness to break down and disintegrate, thus forming cavities; enough of the new growth, however, always being left in the wall of the cavity to determine its tuberculous character.

Differing also from phthisis pulmonalis, in that many cases, even with large cavities, have been proved to be free from tubercle bacilli.

PHTHISIS PULMONALIS.—An inflammatory disease of the lungs, distinguished by rapid consolidation, which, however, may clear up if the process has not gone far enough to damage irretrievably the lung substance, and notable for the frequency with which it follows bronchopneumonia. Differing from tuberculosis in that there is no formation whatever of new tissue; from beginning to end the process is one of inflammatory exudation, breaking down, or caseation, ending in the formation of cavities. Differing also from tuberculosis in the regularity with which tubercle bacilli are found in this disease, and their enormous numbers in the most acute forms.

CHRONIC OR FIBROID PHTHISIS.—This from the beginning is a chronic change acting on the fibrous or interstitial tissue of the lungs. It may follow from many causes, such as the inhalation of irritating particles, or the presence in the lung of a consolidation, such as that of croupous pneumonia, which has not undergone resolution. Arising from such various causes, the clinical features will vary accordingly. The pathological change, however, is always the same, an increased growth of fibrous tissue which contracts, and in so doing damages the lung substance. Inflammatory action may, however, take place in a lung the subject of fibrous change which may be followed by caseation, and in this way the discrepancies in the accounts as to the relation of the tubercle bacillus to this disease may be accounted for.

The above classification is suggested, and will, we think, bear more minute investigation. It is, in fact, the classification of the older writers, which has been set aside by the discovery of Koch's tubercle bacillus, and we contend that this discovery is not sufficient, and cannot sustain the sweeping change that has recently been made in the views of many regarding these lung diseases. Koch himself laid down some axioms as necessary to be fulfilled before a given microorganism could be accepted as the virus of a given disease. They are, as stated by Dr. Pye-Smith in the second edition of Fagge's *Practice of Medicine*:

1. The malady must have such distinct and constant features, whether *clinical* or *anatomical*, as shall enable it to be identified.
2. The microorganism must be itself distinguishable from all others by its size and shape, its staining properties, but above all by its mode

of propagation in a pure cultivation (*i.e.*, artificial separation from other organisms), and by the form, color, and general appearance of the colonies it produces, and its mode of growth, both in plate cultivation, in tubes, and in drop cultures.

3. The organism thus identified must occur in the blood or tissues, not merely on the surface (cutaneous or intestinal), but below the epithelium, in the lymph-spaces or bloodvessels, *in every case of the disease in question.*

4. It must not occur in the human body, except in cases of the particular disease in question.

It may, however, conceivably occur in other animals without giving rise to the same pathological symptoms, or in air or water—as of course it does occur in the test-tubes and plates of “pure cultivations.”

5. When a pure cultivation of the organism is introduced into the blood and tissues of an animal, the *phenomena* (*clinical and anatomical*) of the disease in question must be reproduced.

6. From that animal a “pure cultivation” must be again capable of reproduction, from which another animal may be again infected, and so on.

Now, taking the first canon, we would ask, Are the clinical and anatomical features distinct and constant? We have given data enough to show that they are not. Dr. Klein, in his description of the lesions in acute miliary tuberculosis, marks the sharp distinction into two forms.

And yet we have Germain-Sée, in his work on *Bacillary Phthisis*, making the following statements:

“1. The unity of phthisis, comprising all *acute* and *chronic* manifestations. There exists no dualism between tubercle and caseous pneumonia; no distinction between tubercular phthisis and inflammatory phthisis.”

“2. Analogy, even identity, of tubercular nodule with inflammatory nodule from the histological point of view.”

This is exact science with a vengeance.

Professor Hamilton, in his work on *The Pathology of Bronchitis*, speaks of disseminated catarrhal pneumonia. He says:

“The most curious point about these deposits is that they have not the slightest tubercular structure, but in all respects are identical with what is seen in the second stage of catarrhal pneumonia; they are small isolated groups of air-vesicles filled with epithelial products, the group invariably cascating in the centre. Every one has exactly the same appearance; there is not a vestige of any giant-cell structure; there is nothing of an interstitial character in the nodules. The whole process is one of catarrhal accumulation in the air-sacs, followed by necrosis of the mass; and the only difference between this and ordinary catarrhal pneumonia is in the fact of the nodules being small in size and isolated in character, and universally disseminated throughout the lung substance.”

We have pointed out that these nodules always contain numbers of tubercle bacilli.

In speaking of Koch's axioms, Dr. Pye-Smith (*loc. cit.*) says:

"The microorganism of tubercle is believed to be constant, specific, and pathogenic, but its relation to much of what is clinically and anatomically called tubercle in man is not fully established. Here the first of the above conditions is wanting."

Here, then, at the outset we find the tubercle bacillus not filling the first of the conditions established by its discoverer as essential to its position as the virus of the disease.

Secondly, if we take the question of size, the bacillus tuberculosis is at once separated from that found in bovine tuberculosis, although the reaction to staining agents is the same.

Next, in its staining properties it is not distinguishable from the lepra bacillus, from the numerous bacilli found in birds and other animals, the account of which has been already given, or from a form of micrococcus isolated by one of us from urine. These cannot be tubercle bacilli, as they do not produce the disease in the animals in which they are found. We shall have something to say on the mode of growth in cultivations later on.

Thirdly, this canon is not fulfilled by Koch's tubercle bacillus, as Koch himself has recorded cases where the disease existed and no bacilli could be found. We have shown that such has also been our experience in a number of cases.

Fourthly, to answer this canon the particular disease must be accurately defined.

Fifthly, we have proved that the induced disease by inoculation in the lower animals has no features similar either to reticular tubercle or caseous phthisis.

We have then a microorganism which is considered by many to be firmly established as the virus of a disease, to establish which connection its discoverer has laid down a set of rigid laws, and we find that this microorganism does not fill the conditions of any one of these laws.

It may be asked how has the microorganism arrived at this anomalous position? The answer is simple. This solution of the tubercular problem took a vivid hold on the imaginations of many men, the majority of whom had no special training for histological or pathological work. It was carried by acclamation, and any questioning of its position was received as little short of blasphemy. Even at the present day there are some men who seem to consider it a personal insult to them to doubt the infallibility of the tubercle bacillus. We have, however, been working for a number of years on this question, and we wish to bring before the medical profession our views founded on actual

practical work, and we feel sure of fair criticism from those men who are capable of looking at both sides of a question.

These diseases of the lungs cause such misery and such a large percentage of deaths that any addition to our knowledge of their causation can only act beneficially on the human race. When we see the divided opinions concerning these diseases held by our best men, we cannot but feel that the end is not reached yet, and when we consider the enormous amount of work that has been done in bacteriology generally, and especially in connection with tuberculosis, in the last ten years, we stand appalled at the very slight (if any) benefit we have derived from it. In our treatment of these diseases we cannot but think that the investigations have been made in the wrong direction. To think that men should be content to consider the virus of a disease found, and yet to remain without any further means of combating that disease after this discovery, would be an impossibility, and this is proved by the immense number of remedial measures brought forward, all to be faithfully tried, and all to fail.

We cannot help thinking that the chemical side of the question has been almost entirely neglected. What have the chemists told us about caseation; of what is it composed; and is it in all cases an identical chemical substance? This is a most important question, and one that ought to be fully worked out. It would then be shown whether the substance produced by the disintegration of reticular tubercular formation is identical with that found after the breaking down of consolidation following broncho-pneumonia. It is nonsense to assert that these are the same, and that they are caused by a specific microörganism we want chemical proof.

We have lately had a case which was diagnosed during life as phthisis. There was a large amount of consolidation ending in the formation of cavities. A number of guinea-pigs were inoculated with sputum from this case, and the bacilli were so numerous that it was used for practical class demonstration. At the post-mortem examination there were the usual appearances of phthisis pulmonalis, yet the microscope revealed the fact that the case was one of croupous pneumonia, the consolidation of which had not undergone resolution. Not one of the guinea-pigs inoculated developed the so-called tuberculosis. They all had large abscesses at the seat of inoculation, containing fluid pus, with numbers of tubercle bacilli, but in no case were the lungs affected. In one case there were some abscesses in the liver and spleen, and one guinea-pig is still living, seemingly unaffected, the inoculation abscess having healed. Whatever may be the true explanation of this case, the fact remains that sputum taken from a case where the lung is rapidly breaking down after croupous pneumonia, and which sputum was loaded with bacilli, did not produce the lesions in the guinea-pig that

we may confidently look for when using sputum from a case of phthisis pulmonalis.

We think that if the fact were universally admitted that cavities in the lungs were formed by two distinct methods we should be better able to treat these diseases—as one form that of the inflammatory kind, is distinctly amenable to treatment if taken early enough, and if the lesions in these inflammatory cases were recognized at an early stage we are confident that more cures of cases of phthisis would be recorded, although the tendency of the present time is certainly in that direction.

With regard to tuberculosis proper it is probably an incurable disease, as is cancer, when occurring in an internal organ; at any rate, in the present state of our knowledge of these diseases, associated with the formation of new and alien tissue.

It may be thought that we should express some opinion as to the part the bacillus tuberculosis plays in these diseases. Here we are met by a difficulty. It seems beyond a doubt that this microörganism is intimately associated with caseation, and we know that it is never absent from that degeneration when it follows phthisis pulmonalis; but we also find it in degeneration of tubercular new-growth. Now, the question arises, Are these the same bacilli?

We have shown that in bovine tuberculosis the bacillus has the same chemical reaction as that of Koch, and yet it is much smaller. We know from careful and repeated observations that the bacillus varies in size considerably in various cases of phthisis; more especially is this noticeable in cases of acute phthisis or galloping consumption. Here the bacilli are large, long, and contain numbers of so-called spores. In other cases the bacilli are much smaller and shorter. Another point we have observed is, that in scrofulous glands removed from the neck and placed in spirit, after some years the bacilli lose their power of reacting to the specific staining agent, and before this power is quite gone—that is when they have not been so long in spirit—they will stain fairly well, but the reaction completely disappears in twenty-four hours, although bacilli in sections of lungs kept many years in spirit took the same stain well and still retain it. We have already pointed out this peculiarity in the bacilli of bovine tuberculosis. There are several cases on record where the mesenteric glands have been found after death changed into masses of calcification. This is what we have already pointed out as occurring so often in bovine tuberculosis. We have a number of cases in which *tabes mesenterica* was directly traced to the ingestion of cow's milk.

Is it possible that tuberculosis, as we understand it, has any distinct relation to bovine tuberculosis, through infection from the milk of a tuberculous cow? This has occurred to us as a possibility, and as such

we bring it to the notice of the profession. We should then have two forms of tubercle bacilli, the one derived from an outer source, and producing tuberculosis, either directly or through some poisonous product, this might take place in a gland or other part. This gland, becoming caseous first, would after a time infect the whole organism, and this infection would take varied forms, according to the situation of the part first infected, and its means of communication with the rest of the body. The other, a bacillus having a similar chemical reaction to the first, but associated in some way with caseation. It cannot be the cause of the disease here, as we find it in cases where we have bronchitis extending into the lungs, and causing broncho-pneumonia, the consolidation so formed not clearing up, but breaking down, and containing numerous bacilli with specific reaction. To explain it by the theory that there is a specific and a non-specific broncho-pneumonia seems to us to be a very lame way out of a difficulty. We do not give this idea as mere theory, but we have some facts which have induced us to consider the matter, and we are carrying on a series of investigations on these lines. There may be nothing in it, but we would ask the kind consideration of those men who are not wedded to the unity of phthisis on this point.

As to heredity and contagion our work is still in progress, and it will take a much longer time than we have yet devoted to these questions before we can get reliable data to work on. In the meantime we would say that the results we have laid before the profession are those of honest work, and all we ask is fair and open criticism of this work by those competent to do so.

SALOL IN ACUTE TONSILLITIS AND PHARYNGITIS.¹

BY JONATHAN WRIGHT, M.D.,

OF BROOKLYN, N. Y.

THE majority of our most efficient drugs are used empirically. We all know what mercury does for syphilis and what quinine does for malaria. Our great ignorance of chemical and biological changes compels us to reason directly from sequence to antecedent. The results which follow the administration of some drugs are so constant and so direct that we hardly appreciate the gap in our real knowledge of their *modus operandi*. The testimony in regard to them is too overwhelming for us to doubt for a moment their being the causes of the results which follow their use.

¹ Presented and accepted as a candidate's thesis for membership in the American Laryngological Association, May, 1890.

When we reach a slightly lower grade in the pharmacopœial list—iron, arsenic, salicylic acid, the phosphates—it behooves us to draw our conclusions in regard to cause and effect with greater caution in any given case.

Everyone recognizes that certain diseases, such as pneumonia, diphtheria, and typhoid fever, often result in recovery or death irrespective of any plan of treatment whatever. Certain more chronic and more usually fatal diseases, such as phthisis, chronic nephritis, and diabetes, often have their periods of temporary improvement and depression without, as well as with, treatment. The effects of therapeutic measures in all such affections are to be judged with great reserve, and they necessitate the collection and careful analysis of a large amount of clinical experience.

This is still more eminently so of simple acute tonsillar or pharyngeal inflammations, which, almost without exception, end in recovery and are self-limiting diseases. The duration of the subjective symptoms, which are our principal and the patient's sole concern, varies so much that conclusions drawn from the effects of any plan of treatment in a limited number of cases are apt to be extremely fallacious. General impressions made upon the observer are still more so, depending as they do upon individual power of observation and upon the strength of his imagination. Owing to these considerations, it was with a good deal of scepticism that I read the article of Gouguenheim¹ in which he spoke so enthusiastically of the treatment of acute inflammations of the pharynx by the internal administration of salol. He quotes Dr. Capart, of Brussels, as speaking of its "almost miraculous action." He reported twenty-two cases, and his claims were so strong of its power in relieving dysphagia in these annoying and very common affections that, recommended by such an authority, it seemed worthy of a trial. The results which I have obtained form the excuse for this paper.

Max Thorner, of Cincinnati, has given the best and fullest account² of salol in this country, and was the first, as far as I know, to give it internally for throat affections. It may, nevertheless, not be superfluous to give a brief synopsis of its nature, and of its physiological and therapeutical action, as spoken of by him and others.

It was discovered by Nencki, a Swiss chemist, in 1883, and first used by Sahli³ in 1886. It is a colorless substance, sold in the shops as a coarse white crystalline powder. It has a marked aromatic odor, and a faint taste, which is rather agreeable than otherwise. Chemically it consists of salicylic acid in which one atom of hydrogen has been re-

¹ *Annales des Mal. de l'oreille, etc.*, No. 9, 1889.

² *Cincinnati Lancet Clinic*, Dec. 10, 1887.

³ *Correspl. f. Schw. Aertze*, Nos. 12 and 13, 1886.

placed by the phenol group, and contains synthetically forty per cent. of the latter and sixty per cent. of the former. It is a proprietary article, made abroad, and usually sells at four dollars a pound.

It is insoluble in water, but, like the fats, is soluble in alcohol and ether, and is decomposed by sodium bicarbonate.¹ Hence it should not be given in combination with the latter. It forms emulsions easily. Though crystalline in structure, it cannot be reduced to a fine powder, on account of the tendency of its particles to cohere. It has a low melting point (43° C.).

It is insoluble in the gastric juice, but is readily dissolved in the pancreatic and intestinal secretions, where it is separated into its primary constituents, both of which are readily absorbed and appear in the urine, giving it the olive-green color caused by carbolic acid. In thirty-grain doses it is a powerful antipyretic, but in smaller and frequently repeated doses (five grains every hour) it is not so efficient in this regard.² Its odor is very distinctly appreciated in the secretions and in the expired air.

The unique characteristic of salol in being able to pass the gastric juice unchanged, while in the intestines it is decomposed into phenol and salicylic acid, both being antiseptics, has been taken advantage of in treating the summer diarrhœas of children. The rapidity with which these drugs are absorbed and the promptness with which they appear in the urine have made it valuable in treating cystitis, pyelitis, and gonorrhœa.

Attempts have been made, with doubtful degrees of success, to diagnose motor insufficiency of the stomach by noting the time required for its appearance in the urine as phenol after administration. This varies within such comparatively wide limits normally (thirty to ninety minutes) that it has not proved of much service for diagnostic purposes. It has been used locally as a dry dressing, and as a mouth and nose wash, dissolved in alcohol and mixed with water, but with very moderate results. It has been used as an antipyretic successfully. But its principal use has been as a substitute for the compounds of salicylic acid in the treatment of rheumatism.

Its advantage over the former, it is claimed, consists in its agreeing better with the stomach and in its not producing the disagreeable head symptoms noticed in large doses of salicylic acid. The former assertion I think, from my own experience, true, but I have noticed occasionally tinnitus aurium and headache in doses of two drachms daily. This being equivalent in salicylic acid to about seventy grains, does not show any very great advantage over that drug. Like salicylic

¹ Nencki: *Therap. Monatsheft*, Nov. 1887.

² Georgi: *Berl. klin. Woch.*, Feb. 28, 1887.

acid—perhaps more often—it utterly fails, in rare cases, to have any effect on rheumatism whatever. There seems to be evidence to show that its analgesic effect is more pronounced in rheumatism than the salicylates. Rosenberg¹ says that pain disappears as a rule in twenty-four to forty-eight hours, and never later than five days.

Bartholow² says: "The effects of salicylic acid are increased in all directions by members of the phenol group." This probably explains why ninety grains of salol will do more work in rheumatism than the fifty grains of salicylic acid which it contains. Nencki³ has lately recommended the salicylate of creosol for internal use rather than salol (salicylate of phenol), on account of its being less liable to cause disagreeable symptoms. Ninety grains of salol daily are sufficient for throat inflammations, and this dose rarely, if ever, causes any head symptoms. Three drachms daily are mentioned as the maximum dose, but I have never given over two. It has proved of service in sciatica and lumbago.

The observations on its effects in allaying the pain in rheumatism are interesting in a consideration of its action on the dysphagia of acute throat affections, the time in which it is said to relieve the pain—twenty-four to forty-eight hours—corresponding very closely to my experience. Its occasional entire failure is also noted in both cases. The carboloria, which is always present, is the only sign of any phenol poisoning that is noticed, and need consequently give rise to no apprehensions.

In its administration I have never given less than sixty grains daily, nor more than one hundred and twenty, the most frequent dose having been ninety grains for adults. It may be given in powder form or as an emulsion. The most efficient method is to give it in ten-grain doses every two hours during the day. Wyeth & Brother, of Philadelphia, made a lozenge for me containing five grains of salol with some licorice and sugar which may be found of value, but I have no faith in its local action whatever, both from theoretical reasons and from practical experience, its insolubility being sufficient to explain its lack of power in this regard.

I have noticed the most marked effect in lacunar tonsillitis, less in catarrhal pharyngitis, and least in a well-developed quinsy. For the latter, hot fomentations and free incision are the best remedies, though salol may be given as an adjuvant. This, of course, only applies to cases after the fourth day, before that time the greatest relief being often obtainable by the use of the drug.

We know that the pain in any form of simple acute tonsillitis or pharyngitis is apt to disappear after the third day under any plan of

¹ Therap. Monatsheft, 1887, p. 51.

² Materia Medica and Therapeutics, 1887, p. 335.

³ Ref. Centrbl. f. Bact., No. 12, 1890, p. 386.

treatment. This is eminently true of the catarrhal and lacunar forms. When the inflammation, however, extends deeper and involves the parenchyma and peritonsillar tissue, the duration is sure to be longer. One form may, of course, merge into the other, they being usually only different degrees of the same disease. In considering their treatment, it is therefore manifestly misleading to class all cases together, whether treatment has begun upon the first, second, or third day. Like all diseases, the younger the patient, the quicker does he respond to treatment.

In preparing the accompanying tables I have divided the cases into three classes: those in whom treatment was begun on or before the second day, those beginning during the third day, and, lastly, those beginning treatment on the fourth or later days. I have based my calculations on the patients' statements in regard to the pain, that being the most striking and interesting phenomenon to them. My material is principally drawn from the case-books of my clinics at the Roosevelt and Demilt dispensaries in New York, from November, 1889, to May, 1890. I am indebted to my friend, Dr. J. E. Newcomb, for the data of several cases coming under his observation elsewhere.

TABLE I.—CASES IN WHICH TREATMENT WAS BEGUN ON OR BEFORE THE SECOND DAY OF THE DISEASE.

Case.	Sex.	Age.	Diagnosis.	Day of disease.	Relief from pain (hours).	
1	F.	40	Lacunar tonsillitis.	Second	24	
2	M.	24	" "	Second	18	
3	M.	18	" "	First	12	
4	M.	7	" "	First	24	
5	F.	26	" "	Second	24	
6	F.	40	" "	Second	12	
7	F.	9	" "	Second	24	
8	?	?	" "	First	12	
9	F.	13	" "	First	24	
10	?	?	?	Second	None	No relief; records defective.
11	F.	27	Lacunar tonsillitis.	Second	18	
12	F.	17	" "	Second	6	
13	M.	20	Parenchymatous tonsillitis.	Second	None	Pain grew steadily worse; 1 drachm given.
14	F.	28	Catarrhal pharyngitis.	Second	30	Also coryza.
15	F.	23	Lacunar tonsillitis.	First	4	Atrophic rhinitis.
16	M.	22	" "	Second	4	Swelling increased when next seen; two days later no pain.
17	F.	18	Catarrhal pharyngitis.	Second	24	
18	F.	24	" "	Second	12	Partial.
19	F.	21	Lacunar tonsillitis.	First	21	
20	M.	25	" "	Second	6	Supervened on uvulotomy; pain in uvula not relieved with the dysphagia from the tonsillitis.
21	F.	26	Parenchymatous tonsillitis.	Second	36	
Average					17+	

TABLE II.—CASES IN WHICH TREATMENT WAS BEGUN ON THE THIRD DAY OF THE DISEASE.

Case.	Sex.	Age.	Diagnosis.	Day of disease.	Relief from pain (hours)	
1	M.	19	Lacunar tonsillitis.	Third	28	No relief from pain.
2	M.	22	Quinsy.	"	...	
3	M.	19	Catarrhal pharyngitis.	"	48	
4	F.	18	Lacunar tonsillitis.	"	24	
5	F.	23	Quinsy?	"	24	
6	F.	30	Lacunar tonsillitis.	"	24	No relief from pain. Cure in five days. xxx grain doses produced anorexia.
7	M.	12	" "	"	24	
8	F.	13	" "	"	24	
9	F.	9	" "	"	24	
10	F.	18	Quinsy.	"	None	
11	M.	17	Lacunar tonsillitis.	"	24	
12	F.	25	" "	"	12	
13	F.	19	" "	"	24	
14	M.	24	" "	"	24	
Average					27	

TABLE III.—CASES IN WHICH TREATMENT WAS BEGUN AFTER THE THIRD DAY OF THE DISEASE.

Case.	Sex.	Age.	Diagnosis.	Day of disease.	Relief from pain (hours).	
1	F.	11	Lacunar tonsillitis.	Sixth	24	Well in four days.
2	M.	16	" "	Fifth	28	
3	M.	21	Quinsy.	Seventh	24	
4	F.	28	Catarrhal pharyngitis.	Fourth	24	Colored patient. Patient's hoarseness also relieved.
5	F.	24	Lacunar tonsillitis.	Fourth	24	
6	F.	30	Acute catarrhal pharyngitis and laryngitis.	Seventh	6	
7	M.	19	Quinsy.	Fourth	24	Patient had pain in bones (spec. ?) at night, which was not relieved Phthisis case.
8	M.	13	Lacunar tonsillitis.	Tenth	36	
9	F.	19	" "	Fifth	3	
10	F.	38	Catarrhal pharyngitis.	Eighth	12	
11	M.	28	Quinsy?	Fourth	48	
12	F.	19	Lacunar tonsillitis.	Fifth	3	
13	F.	20	Catarrhal pharyngitis.	Fifth	24	
14	M.	36	" "	Fifth	36	
15	M.	40	Quinsy	Fourth	24	
Average					24	

Depending so entirely upon the statement of the patient as is necessary where reference is made to subjective symptoms, a great deal has to be allowed for his individual idiosyncrasies. Some patients, and they are not rare, among the dispensary class only admit relief from suffering with great reluctance. Others, and everyone will admit they are fewer, take a more optimistic view of every remedial agent than the facts warrant. However, in as large a number as I have here reported such errors, to some extent, will correct themselves in the average.

In recording the answers of the patients in regard to the pain, care

has been taken to ascertain that the relief after the time noted was marked. In doubtful answers the time recorded was lengthened rather than shortened. Therefore it must be understood that all the figures are rather approximate than literal. The relief from the pain coincided in nearly all cases with the relief of the constitutional symptoms, but, strange to say, and the same remark has been made by Gouguenheim, the subsidence of the pain was often complete before the swelling or congestion had appreciably diminished. Indeed, in a few cases of parenchymatous inflammation, and in one case of peritonsillar suppuration, I have seen the swelling increase after almost entire abolition of the pain. I am unable to account for this, but the fact is incontestable. In lacunar tonsillitis, however, the disappearance of the little mucous plugs from the lacunæ was more synchronous with the abolition of the pain.

Thorner has laid great stress upon a rheumatic history in these cases. A complete previous and family history is taken, as a matter of routine, of every case in my dispensary classes, and the question of a rheumatic history is always looked into. I have never been able to convince myself that a previous or a family history of rheumatism was any more frequent in the mild acute inflammations of the throat than coincidence would account for. In the severer forms of quinsy and parenchymatous tonsillitis there is an undoubted preponderance. I believe many of the cases of lacunar and catarrhal pharyngitis reported here would, without treatment, have gone on in their later stages to parenchymatous or peritonsillar inflammation.

It will be noted that those cases, 21 in all, where treatment was begun in the first 48 hours, obtained relief, on the average, in 17 hours, the shortest being 4 hours and the longest 36 hours, while 2 received no benefit, the record as to the diagnosis in one of them being incomplete.

The second class of cases, those in whom treatment was begun on the third day, received benefit, if any, in 27 hours on the average. Two also, in this division of 14, received no appreciable benefit, both having had quinsy. The shortest time was 12 hours, the longest 48 hours, in receiving benefit.

The third division, 15 in all, obtained relief in 24 hours on the average.

It will be seen that those beginning treatment after the third day recovered more quickly, on the average, than those in the second division. This was because, no doubt, many were already improving when treatment was begun. Indeed, the last two divisions are of value principally as a means of comparison with the first, to which, of course, the greater value is to be attached, leaving everyone, according to his own convictions, to judge of the results in the other cases.

The cases recorded are all those which occurred under my own observation, or that of Dr. Newcomb, in whom the results could be

learned. None were excluded who, I was at all sure, had taken the medicine, excepting a few who were too stupid to give intelligible answers. Besides the cases recorded, I have probably given it in as many more, from whom nothing could be learned, as they did not return a second time. It is fair to presume that these cases also received the average benefit, or they would have reappeared.

I have previously used extensively salicylate and bicarbonate of sodium both internally and locally. I have used the combination of chlorate of potash with tr. ferri chlor. in many cases. In a few cases I have used the benzoate of sodium. Occasionally I have only given astringent and chloral hydrate gargles. In all methods of treatment, of course, the bowels were kept open with salines or calomel. My experience with guaiac is not sufficient to allow me to judge personally of its merits. As far as my observation goes, I should rank it after salicylate of sodium. Many claim it to be a specific, but its intensely disagreeable taste and its irritating effect on the stomach, and, in my hands, its uncertain action, make it in many respects an objectionable drug. Of course, my results from other methods have not been tabulated with care, but none of them have ever been so favorable as those indicated in these tables. Occasionally, as before said, salol fails utterly, but in a small proportion of cases.

In conclusion, I cannot do better than translate Gouguenheim's summary, with which I fully agree:

1. Salol acts beneficially in acute anginas of whatever cause.
2. It quiets the pain and dysphagia with the greatest rapidity.
3. In quieting the pain it may shorten the duration of quinsy.
4. It lowers the temperature.
5. In nearly all cases it diminishes the duration of the angina.
6. In order to attain those results, the dose should not be less than four grammes (sixty grains) daily.

A CASE OF SPINA BIFIDA; OPERATION BY EXCISION; RECOVERY.

By J. C. COCKBURN, M.D. (HARVARD),
OF MINNEAPOLIS, MINN.

R. H. Male. Born September 11, 1889, of Scotch parents. Weight at birth, seven pounds. Both parents healthy, and of healthy families. No deficient development in any relative, on either paternal or maternal side, except in a sister of the child's father, who, after having had scarlet fever when five years old, failed to develop greater size than a child of eight or ten years of age. This aunt is said to have been of good form, active, and apparently to have enjoyed good health until she reached the age of puberty.

At this period, instead of developing into womanhood, she began to fail in health, and continued to do so until, at the age of twenty-five years, she died, never having menstruated. In this family, besides this babe, there were one boy and three girls, ranging from two to nine years of age, all in good health, and well developed. When the mother was about three months advanced in this pregnancy she slipped; falling backward, the lumbo-sacral portion of the back came forcibly in contact with a board in the pathway. For a week or ten days following this she experienced a peculiar sensation within the pelvis, and directly beneath the seat of injury, to use her own expression, she felt as if a big lump had swollen upon the inside of her backbone, about where she was hurt by the fall. This sensation gradually passed away, and gestation went on without further incident to full term.

In confinement was attended by a midwife, and the labor was reported as normal.

The parents state that the babe was healthy, vigorous, and well developed at birth, except that over the sacrum was a soft tumor, resembling in shape and size the larger half or end of a hen's egg.

On November 12, 1889, I first saw the case, in consultation with Dr. T. H. Monahan. I found a healthy-looking, well-nourished babe, in size up to the average of infants of its age, and correspondingly bright and active. The tumor had attained a circumference of eight inches, was quite translucent over nearly its whole outer surface, and the skin covering it was, to appearance, thin, tightly stretched, red and shining, and about to ulcerate or rupture.

This tumor was but slightly reducible, and pressure on it elicited none of the nervous symptoms which are produced by pressure, such as muscular twitching, convulsive movements, drowsiness, nor had the parents ever noticed any of these symptoms, only a cry, or moan of pain, or distress, when pressed upon.

The vigor and physical condition of the child gave promise of a favorable result from an operation, and I so advised.

To the parents were explained the almost inevitably fatal result of the case if left to itself; the great chance of death occurring during the operation, or quickly following it; and the reasonable chance of saving the life of the babe by operating. Grasping the situation at once, they readily agreed to and urged the operation.

Two days later, November 14, at 10 o'clock, A. M., assisted by Drs. Monahan and Tupper, I removed the tumor.

The operation was done aseptically. The little patient was put under chloroform, and then ether was administered carefully during the operation. Beginning at the superior portion of the tumor, an elliptical incision was made around it, keeping well back into the healthy skin, the inferior extremity of the incision coming well into the fissure of the nates. The dissection was slowly and carefully made down to the spinal column, which was readily reached, except at the inferior portion, where a dense fibrous band or mass connected the tumor to the sacrum.

The opening in the spinal canal being reached, on all sides the pedicle of the tumor was separated from this dense fibrous band, and the latter cut through.

The tumor was found to emerge from an opening, about one-half or two-thirds of an inch in diameter, in the first vertebra of the sacrum,

resulting from imperfect development of its laminae. The pedicle was about one-half an inch in diameter, and closely filled this opening.

The hips were then raised and the tumor compressed, in order to return as much of the spinal fluid within the membranes of the spinal cord as possible, and a stout catgut ligature was now tied around the pedicle.

At the moment the ligature was tightened a sudden and rigid extension of the lower limbs took place, and also a marked change of the respiration. The audible breathing became silent, and but for the respiratory movement of the chest and abdomen might have been thought to have ceased. A trocar was thrust into the tumor, and three fluidounces of cerebro-spinal fluid were withdrawn; the sac was now cut open, and the cauda equina was found included in the ligature, and the extremity adherent to the dural lining of the sac.

With the hips elevated the ligature around the pedicle was quickly cut. This done the respiration soon became normal, and the other nervous symptoms rapidly abated. The caudal extremities were spread out fan-shaped at their attachment to the lining of the sac; these, with that portion of the dura to which they were attached, were hurriedly dissected from the sac, and an unsuccessful attempt made to return this mass within the spinal canal. The lumen of the pedicle would not admit this, and about three-fourths of an inch of the extremity of cauda, with the adherent dura, was excised. This fan-shaped extremity removed, the remaining portion was readily returned through the opening. Again the pedicle was ligatured and the patient's body replaced in a horizontal position. No nervous symptoms now occurring, after waiting long enough to feel certain that no spinal fluid was escaping, the sac was excised close to the ligature and the stump returned within the spinal canal. The wound was then closed by deep and superficial catgut sutures, and a braided catgut drainage left in the lower portion of the wound.

With aseptic gauze and absorbent cotton the wound was carefully dressed, and this dressing protected as much as possible by oiled silk and adhesive plaster to save it from being soiled by the faeces and urine. The patient was now wrapped in warm blankets, and directions given to keep him warm, and to give only a little whiskey and warm water till evening. The little one rallied well from the anaesthetic, and during the night and next day was allowed to nurse but little. All went well until about 1 o'clock, P. M., the second day, when a convulsion came on. This did not last long. In half an hour the patient was conscious, observant, and bright again. Prescribed R.—Elix. pot. brom., $\text{f}\overline{\text{3}}\text{j}$. Sig. five to ten drops every hour. Five drops of above were administered every hour, and no more convulsions occurred, though once or twice the parents thought the babe more nervous, and gave ten drops.

On the third day, November 16th, the temperature was normal and the dressing was removed, owing to its being soiled with faeces. About three-fourths of the extent of the wound was united, the remainder looked well, with a slight serous discharge from the point where drainage was left, and midway between the extremities of the wound.

November 17. The dressing was not removed; patient doing well.

18th. The wound all united except a small opening at each of the points before referred to.

19th. Apparently doing well; dressing not removed.

20th. Found a slight elevation of temperature and some redness at

the unhealed points; also found that the dressing had been more than usually soiled with urine and feces.

21st. Temperature 101° F., and the unhealed portion of wound appearing about as on previous day.

22d. Found a slight discharge of pus from the wound. Using a weak solution of carbolic acid the wound was well washed out, the fluid passing into one opening and out at the other, and then dressed with iodoform gauze. This treatment was continued until the 26th.

26th. Temperature normal, no pus, wound filling up and healthy in appearance.

28th. Doing well; opening nearly filled to surface.

29th. Temperature again above normal, patient not so well, though no change yet in wound.

30th, A. M. Found elevated temperature, a deep erysipelatous blush of wound and surrounding parts, and right leg very much swollen with considerable pain on moving it. Prescribed

R.—Quin. sulph. gr. xvj.
Yerbazin f 5j.—M.

Sig.—Half a teaspoonful every four hours.

Ordered wound to be freely bathed with a warm, weak solution of carbolic acid, and the following as a warm lotion to be kept continually on the swollen limb:

Tr. opii. f 5j.
Liq. plumbi acetatis f 5ij.—M.

30th, 9 P. M. A slight reduction of temperature and less pain on movement of limb.

December 1. The swelling of limb reduced, temperature lower, slight discharge of pus from the wound; general appearance better.

2d. Still improved.

3d. Temperature was found normal, but little swelling of leg, and but a trace of pus.

4th. No pus, no swelling of leg, and no pain on movement.

8th. Found the wound all healed except a small opening at inferior portion of wound. The patient had a better color and appeared to be gaining again.

10th. Wound completely healed. Cicatrix smooth. Child playful and gaining flesh.

16th. Found the little patient dressed, sitting on his mother's lap playing, the wound smoothly and firmly healed, an apparent increase of flesh since last visit. Pronounced the case recovered.

February 11, 1890. To-day the little boy is five months old and weighs twenty-one pounds. The parents say he is as strong, large, bright, and active as any of their children were at his age. He has perfect use of his limbs and can easily support his weight on his feet. No apparent effect from loss of extremity of cauda equina.

April 11. Seven months old, weighs twenty-three and three-quarters pounds; healthy, strong, and vigorous. Dentition is under way, the two lower incisors being well through, and the gums swollen with the upper incisors. The child sits alone on the floor and plays, and can stand by a chair or any object by which it can hold on. It has perfect use of its limbs and shows no nervous symptoms whatever, and it is now nearly five months since the operation was performed.

REVIEWS.

LEHRBUCH DER GEBURTSHÜLFE EINSCHLIESSLICH DER PATHOLOGIE UND THERAPIE DES WOCHENBETTES. FÜR PRAKTISCHE AERZTE UND STUDIRENDE. Von DR. F. WINCKEL, Professor der Gynäkologie und Director der Königl. Frauenklinik, Mitglied des Obermedicinalausschusses und des Medicinalcomités an der Universität München. Mit 188 Holzschnitten im text. S. 940. Leipzig: Verlag Von Veit u. Comp., 1889.

A TEXT-BOOK OF OBSTETRICS, INCLUDING THE PATHOLOGY AND THERAPEUTICS OF THE PUERPERAL STATE. DESIGNED FOR PRACTITIONERS AND STUDENTS OF MEDICINE. Translated from the first German edition, with permission of the Author, under the supervision of J. CLIFTON EDGAR. 8vo., pp. 927. Philadelphia: P. Blakiston, Son & Co., 1890.

THE work under review is the product of six years' labor by an accepted master in a country which indisputably leads the world in scientific medicine. The acknowledged preëminence of Germany in all scientific studies is the result not so much of the genius of the people as of a paternal government which displays the most consummate wisdom in its direction of educational matters. The training of medical students, of those men who will have the health of the nation in their charge, receives the attention which its importance should always demand in a highly civilized state. Medical schools are distributed at judicious intervals through the country. All the clinical material of their districts is concentrated and employed to the full for the practical training of the students. The teachers are selected with an eye singly to their fitness for the posts they are to fill; they are given salaries that enable them to devote the greater part of their time to study and instruction, and anything they desire in the equipment of their department is granted them. Thus it is that in Germany men of the highest ability are given opportunities to study, to observe, to gain skill in the management of a number of cases that seem, in countries less happily governed in this respect, simply incredible. The author of this work, for instance, gives to the world the result not only of long and profound study, but of a personal experience in more than twenty thousand obstetrical cases. A contrast, this, to a system which permits medical schools to exist as business enterprises, often of the most disreputable character; which forces those institutions that strive for a higher ideal to contend with poverty, and to depend upon the contributions of private individuals; which allows clinical material to be frittered away in wide distribution, often in the hands of individuals incapable of understanding its value.

Winckel, it seems to us, appreciates more fully than any modern writer on obstetrics, the advantages of his position. He asserts his right to speak *ex cathedra*, and there are few who will dispute it. All through

the book individual views are plainly, perhaps dogmatically, advanced, but they are supported by an experience and knowledge of the wants of others which disarm criticism. Few writers on any large division of medical science would be able to illustrate their work entirely by original drawings. That Winckel has done this, shows the range of his experience, and the unusual care with which it has been studied and recorded.

There are certain questions of the day in obstetrics on which Winckel's opinion will naturally be sought with interest. The treatment of abortion and of extra-uterine pregnancy; the causes and management of eclampsia, and the etiology and prevention of puerperal infection are some of these. In the management of abortion Winckel advocates again his well-known views; a conservative course is advised, with frequent disinfection of the parturient tract, until the whole ovum, or a retained decidua or placenta, is expelled rather than operative interference, on the ground that the latter may be the cause of general infection if the retained portion of the ovum is putrefying, by the infection of slight wounds through which invading microbes might gain access to the blood-vessels or lymphatics.

In the treatment of extra-uterine pregnancy, electricity and injection of morphine into the sac are recommended, unless urgent symptoms demand laparotomy: measures which future experience, in our opinion, will condemn as useless. For advanced extra-uterine gestation, laparotomy is, of course, advised, but, curiously enough, complete enucleation of the sac is ignored.

As throwing light upon the causes of eclampsia, prominence is given to the investigations of Stumpf, who found acetone and sugar in the urine of eclamptic patients. A very clear and definite scheme for the treatment of eclampsia is given. Its essential features are diaphoresis, the use of chloroform, and the administration of chloral by the rectum.

The important subject of puerperal infection is fully and clearly dealt with in all its aspects. The still disputed auto-infection, the many kinds of infecting germs which may invade the puerpera, the numerous manifestations of local and general infection, with their preventive and curative treatment, are robbed of the confusion which has long surrounded them. The possibilities of antisepsis in obstetrics are defined; the death-rate from infection should not rise in private or hospital practice above 0.25 per cent.

It goes without saying that we estimate this book highly; indeed, all things considered, we do not know its equal. That it is written in a foreign tongue need no longer be a bar to its wide distribution among English-speaking readers. A translation has appeared very shortly after the publication of the work in German. In all essentials this must have been a fair reflection of the original. Only in clearness of language and literary style could it have been inferior. But in this respect the translator, in our opinion, has performed his task excellently. We believe that this book should find a place in the library of every obstetrical practitioner who desires, in justice to his patients and himself, to be well abreast of the times.

B. C. H.

MAY'S DISEASES OF WOMEN. Second Edition. Revised by LEONARD S. RAU, M.D., Attending Gynecologist to Harlem Hospital, Out-door Department, New York; Attending Physician to the Out-door Department of Bellevue Hospital, New York. 12mo., pp. 373, with 31 woodcuts. Philadelphia: Lea Bros. & Co., 1890.

THIS book is avowedly a compilation. Its object is peculiar. Unlike most larger treatises on the subject, it aims at nothing original and at giving little in minute detail, but tries to give in a most concise form the accepted views of the present day. Indeed, so rigid is the condensation, that much of it is mere category; but the classification is so clear that the purpose of enabling the student to *review* the subject, or the practitioner rapidly to refresh his memory, is admirably fulfilled. Taking as authority some of the best systematic writers, and giving in the main an opinion which is a consensus, there is an absence of personal bias which is not the least valuable point in the work. The difficulty of carrying out the extreme of classification which pervades the book is illustrated in the chapter on Affections of the Vulva. Under the main heading "*Neuroses*," it is said: "These include: 1, Pruritus Vulvæ; 2, Dyspareunia; 3, Vaginismus; 4, Coccygodynia." Now, while allusion is afterward correctly made to the wide origin of dyspareunia, for instance, the awkwardness is apparent in classifying this mere symptom of manifold disorders as a neurosis. But for the purpose of clear presentation of any subject, nothing can exceed the value of systematic arrangement.

In the chapter on the Perineal Body the various forms of prolapsus are considered. The author evidently believes in the importance of the perineal body in the mechanics of support, for the only operations he describes for the restoration of the pelvic floor are two: the old triangular operation, which in practice has often been found wanting in good results; and, second, the flap operation of Tait.

A most instructive and suggestive chapter is that on the Affections of the Vagina, and with few exceptions much praise may be given to the three on the uterus. Eight pages are given to the consideration of inversion of the uterus, which is relatively more than its share.

The short but excellent chapter on the Fallopian Tubes (pp. 10) has been brought well up to date in the present edition.

The electrical treatment of fibroids is dismissed with the following scarcely accurate description: "A galvanic current is passed through the tumor by *puncturing the abdomen on each side with steel electrodes* (*italics ours*); with this instrument a diet consisting largely of nitrogenous matter is selected." (Page 167.)

The chapter on the Pelvic Connective Tissue is the only one which should be rewritten. Since post-mortem examinations and laparotomy have shown in recent years how "pelvic cellulitis," so-called, has been in most cases merely unrecognized tubal disease and pelvic peritonitis, opinions on the subject have been greatly modified. Few published books really represent their authors' present views on this subject.

Decided preference is expressed for electricity in tubal pregnancy, laparotomy being reserved for the abdominal form, and delayed to term, or still longer if the child dies. The extreme rarity and difficulty

of *bona fide* diagnosis prior to rupture, and the enormous mortality to mother and child in the few late operations, are not sufficiently considered.

We are obliged to take issue with the author upon the following points:

That in peritoneal irrigation after laparotomy it is ever justifiable to use 1 : 2000 mercuric chloride solution (page 296).

That after laparotomy a full dose of opium should be given as a routine measure, or a drainage-tube be closed by a cork.

That in peritonitis after operations opium should be given "up to tolerance," if, indeed, any be given at all. No mention is made of treatment by salines.

That in obscure diagnosis between ovarian cyst and normal pregnancy it is ever justifiable to dilate and explore the uterus (page 276). Even removal of the cyst need not terminate the pregnancy.

That it is advisable to wait for "pointing" in pelvic abscess (page 317), and then drain, preferably by the vagina, rather than to evacuate early and drain through the abdominal wall, which is Tait's successful method.

That the hypodermic needle may be freely used for diagnosis in pelvic disorders—*e. g.*, in pyosalpinx (page 276), or extra-uterine pregnancy (page 362), etc.

In many of these points the author has doubtless departed from his original plan, the good plan of the book, namely, in the giving an individual rather than the best collective opinion.

Upon the whole, the book meets its purpose. Whole chapters have been written in other works without expressing more ideas than do pages in this.

G. E. S.

SURGICAL BACTERIOLOGY. By NICHOLAS SENN, M.D., Ph.D., Professor of Principles of Surgery and Surgical Pathology, Rush Medical College, Chicago, Illinois. Octavo, pp. 270. Philadelphia: Lea Bros. & Co., 1889.

THE recent advances in the knowledge of the etiology of the infectious diseases has, as the author says, revolutionized surgical pathology, and for a clear understanding of the processes connected with surgical diseases a knowledge of the claims made by reason of new discoveries is necessary. Whether a work like the one under consideration furnishes the best means for obtaining this information is an open question, and it seems to us that a different plan might have been adopted which would have placed the results more quickly and completely before the reader. The book is a compilation of the experimental work of others with an interwoven and connecting thread of comment. The descriptions of the various organisms are not sufficiently complete to furnish standards for comparison to the experimenter, and this notably in the case of suppurative bacteria, which is greatly to be regretted, for there really seems to be a distinct need of a concise statement of the present condition of our knowledge and an intelligent forecast of the changes in opinion that are likely to come soon. Dr. Senn lays much stress upon the details without sufficiently emphasizing the broader principles underlying them.

There is no question, of course, that the influence of bacteria in the

production of numerous pathological changes is a necessary factor. At the same time the subject is so entirely in its infancy that very much dogma is not advisable. In the book under consideration attention is not sufficiently called to the possibilities of "mixed infection" and of the activity of the ptomaines and leucomaines—the results of bacterial and tissue-cell life—in producing those changes for which the bacteria alone are held responsible by those not especially familiar with the practical work upon the etiology of infectious diseases as now conducted.

H. C. E.

HAND-BOOK OF DERMATOLOGY. By A. H. OHMANN-DUMESNIL, A.M., M.D., Professor of Dermatology, St. Louis College of Physicians and Surgeons. Illustrated. 12mo., pp. 167. St. Louis.

THIS small hand-book, or epitome, as it might better be called, the author states was written as a guide to students in their reading. It is one of the smallest of the current books of the kind. While a good deal has been crowded into its pages, we think much useful information has been omitted, especially in therapeutics. The general statements and the descriptions of the diseases are in accord with the teachings of the majority of American dermatologists. The directions given for the treatment of eczema are general and somewhat vague. The formula for a caustic alkaline tarry solution, for example, is given without informing the reader in what proportions it should be diluted. The list of local remedies mentioned is a small one, and we look in vain for such valuable agents as salicylic acid, resorcin, and ichthyol. Another page might well have been devoted to the treatment of eczema.

We note throughout the volume that the subject of therapeutics does not receive sufficient attention. In saying this we are not unmindful of the statement of the author that he has been careful to include only those remedies and methods of treatment generally recognized as useful. We think too conservative a course has been followed in this matter. The illustrations are poorly executed. The classification presented is that of the American Dermatological Association, which must prove acceptable to all readers.

REPORTS FROM THE LABORATORY OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH. Edited by J. BATTY TUKE, M.D., and G. SIMS WOODHEAD, M.D. Vol. II. 8vo., pp. 279. Edinburgh and London: Young J. Pentland, 1890.

WE learn from the preface to this handsomely published volume, that it is the second of its kind. It embraces the results of a year's laboratory work, comprising the examination of 201 clinical and pathological specimens, with reports upon the same, and 139 photographs of clinical cases, and of microscopic and other specimens which have been taken for members of the profession in Edinburgh and elsewhere. The result

certainly justifies the statement of the preface that the probationary period of the laboratory is passed. The Edinburgh College is to be congratulated upon the work done, and the excellent manner in which its results are given to the profession.

A large portion of the volume is given up to obstetric studies. The first of these is an important communication by Barbour and Webster upon the "Anatomy of Advanced Pregnancy and of Labor as studied by means of Frozen Sections and Casts." Four subjects were used in its researches: the first, a case of pregnancy at the beginning of the eighth month; the second, a woman dying in labor just commencing; the third, and most important of all, the body of a patient dying toward the end of the second stage of labor, and last, a case of death immediately after the completion of the third stage. The points to which attention was especially directed were the relations of the connective tissues in the pelvis as they are affected by labor, and the relations of the connective tissues to the ureters and bloodvessels of the pelvis; also the changes in the relations of the peritoneum in the course of labor; the changes in the position of the bladder; the thickening and distention of the uterine wall during its contraction and retraction in labor, and the relations of the cervix and vagina. In addition to these, the condition of the placenta and membranes, and the changes in the form of the fœtus during labor were investigated.

The technique of these researches consisted in obtaining the cadaver as soon as possible after death, great care being taken not to disturb the parts; the chief bony landmarks were fixed by means of pins to serve as guides in making sections, and the body was frozen for four days. Sections were cut with a broad-bladed saw, which gave perfectly flat surfaces, the sections were placed upon ice and carefully sketched, tracings being taken upon transparent gelatine plates, transferred to paper, and completed in colors. In two cases, the parts of the fœtus were removed, put together, and a completed cast in plaster was made; the entire genital tract was photographed and sketched, and a plaster mould obtained from which gelatine casts were made.

Contrary to the assertions of Stratz, Barbour does not believe that post-mortem displacements of organs occur sufficiently great to invalidate results obtained by this method. The results obtained by Braun, Waldeyer, Chiari, Hart, and others, are compared with those which these investigations yielded.

The third of these specimens already alluded to was the body of a woman regarding whom nothing was known, and in whose body no cause of death was found except fatty degeneration of the heart. She died when labor was well advanced, and furnished a remarkably interesting study; the head of the fœtus was in the pelvis, and the caput had already formed; the occipital bone was beneath both parietals, the body of the child lying transversely, its back to the left side of the mother; the retraction ring formed a well-marked ridge about the genital tract, posteriorly it was opposite the junction of the last two lumbar vertebra, anteriorly three-quarters of an inch above the brim; two inches below the other a prominent ridge was observed between the os internum and os externum corresponding to the cervical wall between the arms and neck of the child; the distinction between os internum and cervix could not be made without microscopical examination; the entire length of

the genital tract was fourteen and one-fifth inches; the placental area was on the anterior surface of the uterus as usual.

Although the membranes had ruptured, the umbilical cord and amniotic fluid remaining in the uterus occupied nineteen cubic inches of space, the pelvic floor projection was two inches, showing that during the second stage the projection is first increased, and as the head drives the coccyx backward it is diminished.

The vagina and cervix were greatly thinned, but the connective tissues were packed so tightly between them and the bones as to lessen greatly the danger of rupture; at this stage of labor the portion of the genital tract within the pelvis has peritoneum in relation to it only posteriorly, a point of importance regarding rupture; the bladder becomes an abdominal organ, and may be distended in its compressed portion; these specimens, and others which the authors have examined, made them believe that the placenta does not become separated during the second stage of labor as the result of diminution of its site; its elasticity is such that it shrinks considerably, following the wall of the uterus as it contracts without separating; regarding the fœtus, the obturator muscles were found to influence the moulding of the head. There seemed a diminution rather than an increase in the flexion of the fœtus during pregnancy; the oval tumor which the fœtus forms at the beginning of labor had been converted into a cylinder, and critical examination of the pelvic floor with a comparison of the results obtained by Schröder, investigations already mentioned, and the authors' lead them to accept Hart's teachings on this subject as correct.

An interesting study of a patient who died just after delivery concludes these most instructive investigations.

We miss from the bibliography the comparatively recent work of Hofmeier and Benckiser; the illustrations are excellent, and the series of studies form a most valuable work in obstetric literature.

The remainder of the volume comprises Symington's study of the pelvic floor, followed by several studies by Hart, which have already been made known to obstetricians in the *Edinburgh Medical Journal*; they are illustrated to advantage in this number, and have already met with the appreciation which they deserve.

Two papers of an especial value to surgeons are included in the volume: one is a paper on "Tuberculosis of Bones and Joints," by Thomson, and the other, a study on "Necrosis of the Bladder," by Haultain; both are well illustrated, and are additions of value to the literature on these subjects.

The volume is concluded by studies in physiology, in the chemistry of the urine, and in the microscopic anatomy of species other than human, which indicate the excellent scope of the work done in the laboratory. We trust that the time is not far distant when the cities of this country possessing established and flourishing medical societies shall be the sites of such scientific workshops as the one from which this volume emanates; such laboratories should not be restricted to the professors and instructors in any one medical school, but should be open for research to members of any reputable society; such a laboratory should not form a factor in the commercial rivalry existing between American medical colleges, but should afford each studious practitioner of medicine an opportunity to investigate clinical cases and verify clinical observations; the support of such institutions is a matter difficult of solution where

royal aid is not forthcoming, but the recent establishment in New York of excellent laboratories makes the solution of the problem far from hopeless.

ILLUSTRATIONS OF DISEASES OF THE SKIN AND SYPHILIS, WITH REMARKS.
By TOM ROBINSON, M.D. 4to. Fasciculus 1. London: J. & A. Churchill, 1890.

THIS number—the first—of this new atlas of skin and syphilis contains three colored plates, one of which presents two figures. The subject illustrated by the first plate is “the aspect of inherited syphilis,” showing the various cutaneous symptoms of a well-marked example of this condition. The coloring is good, and the details satisfactory. It is, in fact, the best of the several plates furnished. The others, showing palmar eczema, palmar syphilis, and kerion, are all fairly good representations. The artist—Bürgen—tends, however, to give the various subjects an unnatural purplish tinge, which somewhat detracts from the otherwise excellent worth of this publication. The accompanying text adds to the value of the work.

H. W. S.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
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EXCRETION OF MORPHINE IN THE MILK.

Numerous cases of poisoning are on record in which the administration of opium or morphine to a nursing mother has produced toxic symptoms in the infant. DR. PINZANNI (*Journal de Médecine de Paris*, March 9, 1890) has found that when morphine is given in therapeutic doses it is not eliminated by the mammary gland as morphine, but it is in the body changed to apomorphine, and in this form is eliminated in the milk.

Dr. Pinzanni made twelve experiments on nursing women, giving to each of them either thirty drops of laudanum or four grains of morphine, distributed in divided doses through several consecutive days, one-half a grain being given during the first day, and the dose being slightly increased after each succeeding day until the total amount was given. The milk was then collected morning and evening and analyzed, the albuminoids being precipitated by the method of Ritthausen.

It was found that the entire amount of morphine was not so eliminated, either as morphine or as apomorphine, and that in certain instances it apparently was not eliminated in any marked degree. It should be noted, however, that this latter conclusion has been contested by Fehling, Tarnier, and Chantreuil, who especially lay stress upon the danger of believing that any preparation of opium can ever be given to a nursing woman without seriously endangering the life or health of the infant; and Fehling regards a case of poisoning occurring in an infant in which laudanum had been given to the nurse as illustrating the truth of his belief. Of course, this fact does not prove that in certain instances morphine may not be eliminated by the mammary gland, but that does not relieve one of the responsibility and recognition of the necessity for caution in giving opiates to nursing women.

A CASE OF POISONING BY ANTIFEBRIN.

PROFESSOR BRIEGER, of Berlin, reports a case of poisoning by antifebrin. A dose of only seven and one-half grains had been taken for headache three times in one hour. The condition of the patient was very alarming, and ether, coffee, and friction had to be used. The symptoms were cyanosis, palpitation, diplopia, and alarm. The headache which had passed off for the nonce, soon returned.—*Lancet*, March 8, 1890.

SANTAL OIL.

A paper in the *Wiener medicinische Blätter* of February 13, 1890, calls attention to the fact that the efficacy of specimens of santal oil is largely dependent upon the origin of the oil—whether obtained from the sandal wood of Zanzibar, Java, or Australia. The Chinese appear to have been the first to recognize the properties of santal oil in arresting gonorrhœa, and for a long time they have refused to make use of any specimens except those derived from Mysore; the Hindus, likewise, use the oil of the wood obtained from this locality, and a number of papers have recently been published which seem to indicate that the antibleorrhœic properties of the oil from this source are especially marked. Dr. Handerson has used the oil from this source and has obtained success where copaiba balsam and cubebs were perfectly inefficacious. Other observers have found oil of santal an active remedy in acute inflammation of the bladder and in chronic urethritis.

In all instances the results obtained were in proportion to the purity of the preparation. It may be given in doses of about three drops, in capsules, in acute gonorrhœa, eight to twelve capsules being given daily; in other affections three to six capsules would be sufficient. The treatment should, of course, be continued for some time after the cessation of the discharge.

USE OF BORAX IN EPILEPSY.

DR. STEWART, assistant medical officer at the Glamorgan County Asylum, has reported seven cases illustrating the value of borax in epilepsy. Case 1, admitted at the age of thirteen, had had epileptic seizures dating from birth, occurring in numbers varying from two to twelve per day, and chiefly at night. She had been under treatment repeatedly, but had derived no benefit. Without treatment the fits during the first week were twenty-six in number, under borax they were reduced to twenty-four in the second and five in the third week. After an interval, free from fits, of sixteen days, four occurred on two successive nights; then, after another interval of nine days, a single fit took place, and since that there had been no recurrence of fits—i. e., a clear interval of over a month.

Case 2 began to suffer from nocturnal epilepsy at eighteen, and came under treatment five years afterward. This case was complicated by serious cardiac disease, stenosis of the mitral orifice. Without treatment, the average monthly number of fits was one hundred and one, and under borax this was reduced to twenty in the first month, seven in the second, one in the third, five in the fourth, none in the fifth, and one in the sixth.

In three others of the seven cases in which the fits occurred, both by day and by night, bromide was shown to exercise a decided influence upon the diurnal seizures, leaving the nocturnal practically unaltered, and in these benefit was experienced from the combined use of bromide and borax, three doses of the former during the day and one single dose of the latter at bedtime.

Dr. Stewart concluded that borax exercises a peculiar influence over nocturnal seizures, and that it is in cases where fits are entirely of that kind that the greatest good may be expected; that bromide, on the other hand, exerts a more powerful influence over diurnal seizures, and that in cases characterized both by day and night fits, a combination of these two remedies will be productive of most benefit.—*Lancet*, April 26, 1890.

A NEW REMEDY FOR SEA-SICKNESS.

In the few cases of sea sickness which Surgeon CHARLES W. HAMILTON, R. N., has had to deal with of late, he has found the internal administration of the seed of the kola (*sterculia acuminata*) a most successful remedy. Half to one drachm of the seed chewed slowly was followed, in about forty minutes, by complete cessation of the various symptoms of *mal de mer*, the depression, vomiting, and giddiness disappeared; the heart's action was regulated and strengthened, and a confidence during heavy weather was obtained that his cases had never before experienced in the many years they had served in the royal navy, and had tried the usual remedies prescribed by their advisers. This remedy seems to be reliable only when freshly procured.—*British Medical Journal*, May 10, 1890.

OUBAÏN IN WHOOPING COUGH.

This alkaloid is obtained from the roots of Ouabaïo, a plant nearly related to the *Carissa schimperi*. It is a crystalline substance, soluble with difficulty in cold, more soluble in hot water. It is best dissolved in strong alcohol.

This substance has been used since October last by DR. WILLIAM GEMMELL, who has treated forty-nine cases of whooping-cough with it. Of these, twenty-five recovered, four died, and the others are still under observation. Of the four fatal cases, one died from diphtheria, one from tubercular meningitis, one from acute capillary bronchitis, and the fourth from gradual and progressive emaciation. None of the fatal cases were under treatment with oubaïn for a longer period than ten days, one of them only for four, and in all of them oubaïn had been stopped at least a week before death took place. In none of the fatal cases were there any symptoms which might have been interpreted as indicative of oubaïn-poisoning.

A careful record was kept of the temperature, pulse, respiration, urine, skin, etc., and the effect of the drug on the number and character of the coughs and whoops of each patient in twenty-four hours was closely watched. Except in one remarkably severe case, treatment was not begun until the patient had been eight days in the hospital; this was to enable comparison to be made of the periods before, during, and after treatment. No patient was dismissed until at least a fortnight after the last cough. The following is a summary of the results of the investigation: Ouabaïn is of marked benefit

during all stages of whooping-cough, and, if carefully used, produces gratifying results. In the first stage it cuts short the attack; in the second it reduces the violence and frequency of the cough, and diminishes the number of whoops, and, in the third, it hastens convalescence in a remarkable manner.

Ouabain is a drug which does not appear to be cumulative: its administration can be stopped suddenly without any ill effect beyond an exacerbation of the whooping-cough; it can be as suddenly resumed. It should be given, at first at any rate, in doses not larger than one-thousandth of a grain every three hours, $\frac{1}{12}$ of a grain daily. For children under one year of age, the dose should not exceed one two-thousandth of a grain every three hours. In children of from six to twelve years of age, if the cough be very violent, and the whoops are numerous, one five-hundredth of a grain may be given at a dose, but the action of the drug must be carefully watched.

The simplest way in which to administer it is to dissolve one grain of ouabain in distilled water so that each minim of the solution shall be equal to one-thousandth of a grain.

R.—Solution ouabain ℥xlviij.
 Syrupi aurantii ʒiv.
 Aquæ, ad ʒvj.—M.

Sig.—A teaspoonful every three hours.

Under the administration of ouabain it is found that the temperature, pulse, and respiration are, in uncomplicated cases, slightly below normal. When the drug is pushed the respiration becomes very slow indeed. In a patient four years old it was often as slow as sixteen per minute. It is from its effect upon the respiration that danger is to be expected. An occasional irregularity of the pulse has been noted, and this always occurred in the evening.

Within a few days, always less than seven, and usually three, of beginning treatment, patients are noticed to be perspiring freely, and this is observed to continue so long as the drug is being given. The patient ceases to perspire so freely shortly after the drug is stopped.

The movement of the bowels is regular, the average number of motions daily was one and a third. In no instance was there any of the diarrhœa which is usually so troublesome a feature in whooping-cough. The appetite improves, as also the general condition of the patient.—*British Medical Journal*, April 26, 1890.

THE ADMINISTRATION OF NITROUS OXIDE GAS.

DR. SILK has reported to the Odontological Society notes on a series of 1000 cases in which nitrous oxide was administered, and which had been systematically recorded by the author.

In twelve per cent. there was more or less itching, in two per cent. asphyxial symptoms necessitating pulling forward the tongue; a good many became hysterical, and several suffered after-effects; but seventy per cent., as far as was known, had no trouble. The average quantity of gas used was between four and five gallons, and the average time during which the face-piece was in position was sixty-seven and a half seconds. The duration of the anes-

thesia was very variable, as it was exceedingly difficult to know when sensibility was recovered; the absence of the conjunctival reflex, or the presence of jactitations, was no guide. In 467 cases pure gas was employed, either from the bottle of compressed gas or through a gasometer, and in 502 a supplemental bag, where the same gas was inhaled over and over again. The record showed that unpleasant effects had immediately followed more often with pure gas than with the use of the supplemental bag, whereas the remoter symptoms occurred in greater number after the use of the supplemental bag; but this was more apparent than real, owing to the less number of cases where pure gas was used, and the great difficulty of getting an authentic account of the after-history of the patient. Micturition occurred in ten cases, or one per cent.; all were females. In three of these there was opisthotonos, and in one much struggling. Erotic movements and sexual illusions were present in six cases—all females; five of whom were unmarried, and one married and in an early stage of pregnancy. There was great difficulty in getting records as to the after-effects of nitrous oxide, but probably more or less headache was the rule rather than the exception.

There was no danger in giving the gas to epileptics. In the only case during lactation the patient had a bilious attack next day, and the infant seemed upset. In one case of valvular disease of the heart, the patient had gas four times, the lividity following being more lasting than normal, and on one occasion a tendency to syncope ensued. In nine cases of pregnant women nothing had gone wrong, but in most there was a tendency to vomit.—*Lancet*, June 14, 1890.

ACCIDENTS WITH COCAINE.

DR. DELBOSC, a pupil of Dr. Reclus, hospital surgeon, who vaunts the employment of cocaine in surgical operations, has just published a statistical and clinical report on the accidents produced by this substance. He collected the histories published of accidents, from which he has been able to establish that up to the present time only five deaths have occurred after the use of cocaine. This proportion would evidently go against the method if only the bare facts be accepted without interpreting them. From the various observations published, it would appear that death resulted from the enormous doses that were administered, varying from about eleven grains to double that quantity. According to Dr. Delbosc, cocaine may be employed at the maximum dose of three grains, although he would not advise such a dose ordinarily, as beyond that quantity serious accidents occur.

To avoid rapidity of absorption, solutions too concentrated should never be employed. Dr. Reclus has adopted a two per cent. solution, and he has never since had any accident, although he has performed, since June last, twenty-five important operations. It is not necessary in order to obtain anæsthesia to push the needle into the muscles or the subcutaneous cellular tissue, but into the thickness of the dermis. In spite of all precautions accidents may occur, and for them nitrite of amyl, injections of ether and caffeine are indicated.—*Medical Record*, June 7, 1890.

DR. MITCHELL has employed coffee in a great many cases when the toxic symptoms of cocaine began to show themselves, and always with perfectly

satisfactory results, and to relieve the extreme nausea, with heart-failure, that sometimes follows the administration of ether.

It is used as ordinarily prepared for the table, and is just as effective when used cold as hot. He does not think caffeine would answer as well.—*Medical Record*, May 31, 1890.

THE PREVENTION OF THE TOXIC EFFECTS OF COCAINE.

DR. ISIDOR GLUCK has had occasion to use cocaine frequently in diseases of the eye, ear, nose, and throat, and seeing at times most alarming effects from its use, came to have a certain dread of it.

It is, when used in the treatment of the nose and throat, and when used hypodermically, that cocaine produces most alarming symptoms. Though employed in strengths varying from four per cent. to twenty per cent., sometimes the weakest solutions will produce the toxic effect in one susceptible.

He now uses the following solution :

R.—Phenol	.	.	.	.	.	.	gtt. ij.
Aque destillat.	.	.	.	.	.	.	5j.
Shake until solution is perfect, then add							
Cocaine hydrochlorate	.	.	.	.	.	.	grs. x.

This formula has been in use for more than a year, and since using no toxic effects of the drug have had to be treated. It has been used in any quantity in any part of the nose or throat, without the least fear of harmful consequences. Phenol is itself a local anæsthetic, and is supposed to prevent absorption of the cocaine by forming a very superficial eschar, and thus its toxic action is avoided. Further, the phenol prevents congestive reaction, prevents the decomposition of the solution, and renders it aseptic.—*Medical Record*, June 21, 1890.

COCAINE AND MORPHINE.

DR. DABBS has found that the morning sickness which complicates the continuous use of morphine hypodermically, can be annihilated by combining one-third of a grain of cocaine with the morphine solution; even though the morphine has to be steadily increased.

[One-third of a grain of cocaine subcutaneously would be a large dose for some patients.—ED.]—*British Medical Journal*, June 14, 1890.

COFFEE IN COCAINE-POISONING.

The many and varied symptoms arising from cocaine-poisoning are so distressing to the patient and trying to the physician that the ingenuity of the latter is often taxed to the utmost in striving to relieve the same. All who have been called upon to relieve these cases have turned, almost instinctively, to such remedies as ammonia, brandy, and digitalis, and have been sorely disappointed where the symptoms were pronounced.

DR. S. MITCHELL used coffee with marked success in a patient who had had cocaine hypodermically. She appeared to have the whole body paralyzed, except her tongue, this unruly member continually uttering words of reproach

for the helpless and hopeless condition in which all the other members had been placed. After using ammonia, brandy, and digitalis, both subcutaneously and by the mouth, also heat and general faradization, without any apparent effect, unless it was to stimulate the patient's tongue, coffee was tried, a clear, large cupful being administered inside of two minutes. The effect was all that could be desired. The pulse soon improved, the pain and sense of oppression about the heart were relieved; in fact, all the disagreeable symptoms, except the stiffness of the muscles, passed away very rapidly, greatly to the relief of patient and physician.

POISONING BY ANTIFEBRIN.

The following case illustrates the dangers of self-medication. A healthy young married woman, who had been in the habit of taking antifebrin for headache, feeling pain come on one morning took, fasting, about a teaspoonful of the drug in some water. In about ten minutes, the headache not being relieved, she repeated the dose, which her husband remarked might prove dangerous. She consequently took a glass of milk and some alum water, in order to produce vomiting, which she succeeded in doing, but immediately afterward giddiness, singing in the ears, throbbing in the temples, and a dull pain in the head, together with a feeling of weakness, came on, and the face assumed a livid hue. About four hours after collapse occurred, and for three and a half hours her condition appeared hopeless. Among other things, the intravenous injection of a solution of common salt was used, and appeared to act most beneficially.

The patient was out of danger about fourteen hours after the drug had been taken.—*Lancet*, May 24, 1890.

MEDICINE.

UNDER THE CHARGE OF

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THE MORPHOLOGY AND DEVELOPMENT OF THE BLOOD.

ALEX. EDINGTON (*British Medical Journal*, 1890, i. 1233) gives an interesting account of the state of our knowledge regarding the blood, and details his own observations upon the subject. He refers to the very varying size of the red blood-cells, and the readiness with which this variation takes place. There is, namely, a distinct variation in the aggregate size between meals, the minimum occurring soon after a meal, while the maximum is seen at the end of a period of fasting. He had also observed that the cells are diminished in size at the termination of acute fever after an exanthem, while they are

largest during the fever. They are small in septic conditions which have lasted some time. He takes the ground that the corpuscle is surrounded by an investing membrane, formed by a condensation of the stroma.

In discussing the white blood-cells he refers to the various forms, as determined by the difference in size, character of the protoplasm, number of the nuclei, etc. He describes at length the methods to be employed in examining the blood, recommending that various plans be followed in every case, in order to eliminate error as far as possible. Staining is often an essential, and for this purpose he prefers the aniline dyes, especially dahlia, methyl-violet, and methyl-blue.

His study of the morphology of the white cell has convinced him that there is an advancing process by nuclear division, until the uninucleated cell becomes one of four nuclei. The protoplasm meanwhile increases in amount, until the final four-nucleated stage is reached, when it begins to stain less readily, as if it were becoming dissipated. The division of the nuclei in the white cells is not an evidence of necrobiosis, as has been claimed, for the characteristic regularity of the process is sufficient evidence against this. Moreover, this phenomenon in other cells is followed by division of the cell itself, and in the case of the white blood-cell such division does not occur. Were the white corpuscles derived from the lymph glands, we could hardly find so many multinucleated forms as we do, since the lymph corpuscle is a cell which possesses one large nucleus. Observation has shown him that the correct view is that when the white blood-cell has reached the four-nuclear stage, the nuclei are set free by the protoplasm being used up or otherwise dispersed, and are then in a condition to act their parts as uninuclear cells. From this view it is evident that white corpuscles may be produced from pre-existing cells within the general circulation.

The author then takes up the various descriptions which have been given of the hæmatoblasts or blood-plates, in order that this body may not be confounded with what he denominates "a new blood corpuscle." These bodies, which he names "albocytes," he believes to be undoubtedly the young form of the red blood-cell. They are small, very delicate, spherical bodies, difficult to detect until the observer has accustomed himself to seeing them. They have nothing whatever to do with fibrin formation, and do not tend to dissolve as Hayem's hæmatoblasts are said to do. In a slide of fresh blood prepared with a sealed cover, they may even be seen after the lapse of a week. In the presence of fluids of specific gravity less than that of blood serum, they suffer from osmotic change just as do the red blood-cells. It is possible to see that the larger of them are distinctly discoid, and one can easily follow their transition up to the condition of the true red blood-cells. The author, therefore, claims that the red blood-cells are derived from these bodies by their gradual growth and change in shape, and by the requirement of hæmoglobin. He has been able to discover the origin of these small corpuscles after long search, and gives a reproduction of a photo-micrograph illustrating their morphology. This is, namely, as follows: The uninuclear white blood-cells possess a large nucleus which stains intensely, and which is surrounded by a narrow ring of protoplasm, which, after a short time, assumes a very ragged appearance. The same method of staining will, however, reveal certain other white blood-cells, whose unusually large nucleus

stains but faintly. Within this nucleus is a nucleolus, also staining faintly; and within this again a very small endo-nucleolus, which is very darkly stained. Within the nucleus, and surrounding the nucleolus, may be seen a number of ill-defined small spherical bodies, the young albocytes, which become liberated in the blood under conditions not yet known to us. The white blood-cells containing these may be looked upon as mother cells, and he therefore denominates them "matricytes." The ring of protoplasm surrounding the nucleus in these cells differs from that in the ordinary white blood-cell in the length of time during which it remains intact. The albocytes may be distinguished from the granular matter of the blood by the fact that the granules possess a peculiar greenish, refractive appearance.

Finally, in discussing the granular matter of the blood, the author divides it into two sorts, one of which, probably the hæmatoblasts of Hayem, is quite evidently associated with fibrin formation, and which tends to break down in the way Hayem describes. The other sort of granules, which do not break down, might easily be mistaken for monads or bacteria. This kind he has observed to be extruded from the white blood-cells while they were undergoing amœboid movements. On being liberated they perform gyratory movements, and dance away across the field. They may also be noticed in an active Brownian movement. He believes that both of them are of the same origin, namely, from the white blood-cells; so that the white corpuscles are the chief agents in inducing fibrin formation, and of these corpuscles the granules of the first sort are the essential cause. The second variety of granules are of a similar nature, but older and undergoing degenerative changes, and have, therefore, lost their power of inducing fibrin formation.

PERNICIOUS ANÆMIA.

NEUSSER (*La Sem. Méd.*, No. 79, 1890) divides pernicious anæmia into two forms—the primary and the secondary. Primary pernicious anæmia is a clinical entity opposed to chlorosis, leucæmia, and pseudo-leucæmia. Secondary pernicious anæmia may be provoked by many diseases, as by frequent hemorrhages; neoplasms; osteo-sarcomata; carcinomata, especially those of the stomach and the spleen; ulcers of the stomach and intestine; chronic nephritis; infectious diseases (tuberculosis, syphilis, diphtheria, septicæmia, malaria); diseases of the blood, as leucæmia and certain forms of myelogenic pseudo-leucæmia; intestinal parasites, as *bothriocephalus latus*, *tænia medio-canellata*, *ankylostomum duodenale*, and even *oxyuris vermicularis*. In the parasitic form, however, the diminution in the number of the red blood-cells rarely reaches that seen in the primary forms. The anæmia usually disappears with the expulsion of the parasite, unless the organism has been already too seriously affected. There may be the coincidence of primary pernicious anæmia with the presence of a tænia. As regards the pathogeny of primary pernicious anæmia, several factors favor its development, such as unhealthy external conditions, defective nutrition, psychic depression, and especially the puerperal state and lactation. In the anæmia of pregnancy the red blood-cells are considerably diminished in number, and the leucocytes equal 5000 to 6000 per cubic millimetre. If, however, the anæmia of the pregnant or parturient woman is due to a septic condition, leucocytosis

may be observed, which sharply distinguishes it from the primary, non-septic variety. Except when it follows a severe hemorrhage or occurs during pregnancy, pernicious anæmia begins during health. The symptoms are those characteristic of grave anæmia, and are described by the author. The gastric symptoms witnessed may be due to atrophy of the gastric tubules, or to simple impoverishment of the blood, or to a degeneration of the posterior columns of the cord, such as has been seen in some cases. They would then be of the nature of *crises gastrique*. The liver and spleen are usually increased in size. The fever seen in anæmia seems to be in direct connection with the diminution in the number of red blood-cells. The toxic substances derived from the hæmoglobin may exert a pyrogenic action, exciting the centre regulating heat; or perhaps the hæmoglobin or the products of its decomposition destroy the leucocytes and the hæmatoblasts and produce an intoxication of the organism by setting at liberty the fibrin ferment. This auto-intoxication may explain other symptoms, as the occurrence of embolism and thrombosis of the small vessels and some of the nervous troubles. The coincidence of febrile reaction and of embolisms in pernicious anæmia may give rise to errors in diagnosis. Thus there are cases of ulcerative endocarditis in which the clinical appearance is identical with that of pernicious anæmia. In the former, however, there are an irregularity of the heart and an alteration of the second sound at the apex.

The number of red blood-cells in pernicious anæmia may be diminished even to 500,000; the number of leucocytes diminishes in the same ratio, but the hæmoglobin, though also reduced in quantity, is not so in proportion to the loss in red cells. The presence of leucocytosis indicates a secondary anæmia. The appearance of nucleated red blood-cells may have considerable prognostic value. So long as they do not surpass in size that of the normal red blood-cell, and so long as the nucleus stains easily with the ordinary reagents, it may be concluded that the regeneration of the blood is going on in the normal manner.

PERNICIOUS ANÆMIA AND SARCOMATA.

ISRAEL and LEYDEN (*Berlin. klin. Wochenschr.*, 1890, 231) discussed before the Berlin Medical Society a case whose history was much as follows: The patient, a woman of about thirty years, exhibited an enlargement of the spleen, then disappearance of the patellar reflex, anæmia, irregular fever, diarrhæa, and severe pains in various parts of the body. Later, there were ascites and bilateral pleural exudate. Numerous small tumors then appeared in the skin. The blood exhibited a decided leucocytosis, and, beside this, the character of pernicious anæmia, being thin, and with abundant microcytes. Further, the large nucleated red blood-cells, which Ehrlich considers characteristic of pernicious anæmia, were present in this case in numbers which Leyden had never seen before. It seemed reasonable, then, to classify this case as one of pernicious anæmia; and yet the matter was not certain, on account of the enlargement of the spleen and the large number of leucocytes present, as well as of the fact that the appearance of the patient was not that of a typical case of pernicious anæmia.

The autopsy showed some fatty degeneration of the heart muscle, but by

no means to the extent seen in pernicious anæmia. The spleen was about ten inches in length, with abundant pulp and enlarged follicles. There were found tumors of various sizes, but none larger than a cherry, and though often widely disseminated through the muscles, they clearly took their rise from the external surface of the periosteum of the bones.

Nodular tumors were present in the marrow of the bones, chiefly in the long bones; the marrow was red and lymphoid in situations where there were none of the yellowish tumors. A few other nodules were found in other parts of the body; namely, on the pleura and peritoneum, and in the thyroid gland, the uterus, and pancreas. The macroscopical characters were those of the growths seen in leukæmia, but the microscopical appearance was quite different. The tumors were a large-celled growth, the cells being round, or often possessing processes, or spindle-shaped, or still oftener being very similar to those seen in the bone-marrow, though there were no giant-cells. Israel cannot answer the question as to the relation existing between the pathological conditions of the different systems of the body, and calls attention to the rarity of such numerous periosteal sarcomata. Leyden says that the autopsy revealed a combination of a sort of leukæmia, pernicious anæmia, and multiple sarcomata, but does not know in what way they stand related to each other.

ON THE EXCRETION OF HÆMATIN AND OF IRON IN CHLOROSIS.

HOESSLIN (*Munch. med. Wochenschr.*, 1890, 248) is of the opinion that there is no reason to separate chlorosis from other forms of anæmia as a peculiar constitutional disease. Virchow's opinion, that it is due to a congenital narrowness of the arterial system, is incorrect, as is shown by the fact, since learned, that the vessels which he considered abnormally narrow were not in reality so. The author is also opposed to the view that there is present in the disease any characteristic condition of the blood, such as a diminution of the amount of hæmoglobin without proportionate reduction in the number of red blood-cells; claiming that this relation may exist in other varieties of anæmia as well.

It is a very frequent occurrence that a girl, previously entirely well, becomes in the course of a few weeks extremely anæmic and chlorotic. Examination of the blood shows a great diminution in the amount of hæmoglobin; and the question arises as to how this loss has taken place. The author believes that it is not due to destruction of the blood within the vessels, and inclines to the view that it is simply the result of hemorrhage, and especially of concealed gastric hemorrhages. In the effort to substantiate this theory he examined the stomach in a large number of autopsies in different diseases, and found, he believes, the evidence that this, of all the organs, is peculiarly liable to suffer from hemorrhages of greater or less degree. He then made over 200 estimations of the amount of iron and of hæmatin present in the stools of normal persons and of chlorotic individuals, and found that in the latter both the iron and the hæmatin were decidedly increased.

That women, rather than men, are attacked by chlorosis is due, first, to the smaller amount of iron in their nourishment; second, to the smaller amount of HCl contained in their gastric secretion, on account of which a sufficient

amount of iron is not dissolved and absorbed; third, to the losses of blood sustained in menstruation.

Other points which the author advances in proof of his theory are: 1. The beneficial results following the administration of iron are due partly to the fact that the chloride of iron formed in the stomach from the iron administered is one of the best known hæmostatics; thereby checking the loss of hæmoglobin at the same time that it increases its formation. 2. The fact that cardialgia and digestive disturbances so usually attend chlorosis. 3. The greenish-yellow color of the skin, hitherto unexplained, is probably due to the resorption of hæmatin and hæmoglobin from the intestine, and their transformation into other coloring matters. 4. The fact that the disease usually does not appear before the time of puberty, and disappears after the climacteric.

WARNINGS OF GENERAL PARALYSIS OF THE INSANE.

SAVAGE (*Brit. Med. Journ.*, 1890, i. 777) was for several years in the habit of getting friends of patients with this disease to fill in a printed sheet relative to the affection. In this way he obtained nearly a hundred such, and from these, combined with experience in consulting practice, he has drawn a considerable number of facts which he believes to be trustworthy.

General paralysis is, he believes, a degeneration rather than a specific disease, and is most commonly seen in middle-aged married men, inhabitants of cities, flesh-eaters, and drinkers of alcohol. It frequently follows constitutional syphilis; and is not uncommonly related to head injury or to causes of nerve-tissue disease, such as those produced by lead.

There are two special forms of onset: the gradual and the sudden. In the former there is a steady and progressive degradation of mind and body, so that the highest faculties show the first evidence of change. In the latter there is nothing to warn until suddenly a convulsive seizure, or an attack of emotional excitement or one of mania appears. Probably in both there were earlier changes going on which were hidden.

In many cases one meets with an account of early fatigue. This may precede the common symptoms by a year or more, and may for a time be replaced by a morbid buoyancy. This sense of fatigue is an important symptom, and is associated with indecision, doubt, gloominess, and even hypochondriacal weakness. It is only really valuable as a symptom when associated with predisposing conditions in which paralysis is common, and when one or more physical symptoms, as inequality of the pupils, or loss of power of expression by speech or writing, can be detected.

Ataxia may be the first symptom of general paralysis, or it may be a symptom of the disease occurring at any period during its progress. The author has known ataxic symptoms to be fully developed for several years before there was any suspicion of general paralysis. In these cases he has always found a history of syphilis. If the ataxy is part of general paralysis there will generally be muscular defect of the hands and tongue out of relation to the progress of the ataxy, and the symptoms will be either those of exaltation or of hypochondriacal melancholia; whereas, if the insanity be that of ordinary ataxy it will be of the suspicious or persecuted type.

One of the most striking and not uncommon of warning symptoms is temporary aphasia. This is not necessarily followed by general paralysis, but the author has seen cases in which this temporary aphasia has come on without apparent cause, and from this date there has been some defect of speech, the lips have been tremulous, or the expression faulty. It is common for these attacks of aphasia to recur at irregular intervals; and after several recurrences—it may be at intervals of a year or more—some other signs of disorder appear. In nearly all these cases disorders of speech and writing are early and clearly evident. The author has known such aphasic attacks occur nine years before symptoms of general paralysis developed.

Nearly related to aphasia, though usually coming after it, is a change in the handwriting. Some patients give up writing or alter their method of holding the pen for a year or more before signs of general paralysis are declared.

Facial expression is very early affected; the wiping out of the lines giving an appearance of fatness. Ptosis and external strabismus are rare as symptoms of general paralysis, but are very common as early symptoms of a diseased process which ends in general paralysis. Thus the author emphasizes his experience, that if after a history of syphilitic cranial nerve lesion there are any signs of nervous instability, there is reason to fear that general paralysis may be the result. In the same class of cases are the instances of serious head injury followed by local paralysis, which has passed off only to be followed by the steady mental and physical degradation which terminated as ordinary general paralysis. Recurring momentary slight or partial losses of power or sensation, sometimes comparable to attacks of *petit mal*, are warnings of general paralysis. An onset of fits of an epileptic type occurring in a middle-aged man, especially if he has had syphilis, prompt one to look for other signs of degeneration. If such fits occur at irregular intervals in an otherwise healthy middle-aged man, and if each fit is attended by marked mental changes, and if expression is in any way permanently affected, general paralysis is all but certain. These fits may precede the ordinary symptoms by several years.

Early sensory defects in general paralysis are not so easily recognized as are the motor alterations. Neuralgia, headache, sciatica, rheumatic pains, and the like antedated by a year or more the recognition of the disease in almost all the author's cases. Headache or facial neuralgia was the most common, in contradistinction to the rarity of headache in the insane. Double sciatica, especially if recurrent and associated with any change in character or habits, is a warning not to be overlooked. Temporary loss of sight, and alterations of hearing, taste, and smell, are sometimes early warning symptoms. Progressive loss of the highest refinement of some of the senses is manifest. Thus the general paralytic artist early loses the fine balance of tone and his colors become bold and crude.

In speaking of the intellectual changes which occur as warnings of general paralysis, the author calls attention to the loss of power of social accommodation as one of the earliest and most marked. The patient falls out of step with his fellows, though entirely unconscious of it. The actor forgets his part, the artisan makes misfits, judgment fails. Memory for recent events or engagements is defective, and this is especially marked if fainting or other

fits have occurred. Loss of power of attention, want of persistence, and restlessness are marked. Moral weaknesses are common; such as stupid stealing of useless articles, and indecent exposure due either to lust or to negligence.

The next group of early symptoms may be provisionally classed as instability. This is evidenced as tremors of the finer muscles, uncertainty of gait, tendency to falls. It is a very common thing to hear that a fall has been the cause of the paralysis, whereas it was but the evidence of early paresis. This instability is marked almost always by the extreme readiness with which the patient is affected by stimulants, or drugs, or poisons. This evidence of weakness of the damaged brain is practically of great value.

Change of temper and character are probably the most constant of all the changes of early general paralysis. Change of character, instability of purpose, occurring with some motor weakness, almost always point to general paralysis if met with in a middle-aged man. Hypochondriasis may be one of the warnings of the disease. In such cases the morbid ideas are, as a rule, centred in the gastro-intestinal tract, and in addition there are physical signs, such as inequality of the pupils or speech defect, to aid us. The occurrence of marked hysterical or hystero-epileptic fits is even more alarming than the epileptic fits in middle-aged men, to which reference has already been made. The sudden outbreak of mania, especially of acute delirious mania, unpreceded by melancholia, and without apparent cause, is a frequent precursor of general paralysis.

PATHOLOGICAL ANATOMY OF FRIEDREICH'S ATAXIA.

BLOCQ and MARINESCU (*La Sem. Méd.*, 1890, 76) report the result of the examination of the cord from a case of Friedreich's ataxia. The cord was irregularly and considerably atrophied both in its transverse and its antero-posterior diameter. The columns of Goll were diseased throughout; those of Burdach irregularly involved as far as the decussation of the pyramids. The crossed pyramidal tracts were altered throughout their entirety, but the lesion decreased from below upward as far as the decussation. The cerebellar columns were attacked from the lower dorsal region; the columns of Gowers were not affected, at least in the limits which have been assigned to them. The portion of the gray matter corresponding to the zone of Lissauer was involved in the inferior lumbar region, but completely free above; the external marginal zone was unaffected; the columns of Clarke were profoundly diseased in all their extent; both fine fibres and cells.

They come to the following conclusions:

1. The spinal cord presented in this case a diminution in volume greater than has been observed by other authors.
2. The distribution of the lesions was almost the same as has been established for the disease in other cases. It differed, however, in that the zone of Lissauer was invaded, at least in the middle and lower regions.
3. Friedreich's ataxia is distinguished from tabes by its topography (the involvement of certain parts of the lateral tracts) and by the nature of the lesions.
4. It differs from certain cases of combined tabes in that the sclerosis is

more systemic, and is subject to the laws of degeneration, not extending by continuity.

5. In regard to the nature of the disease, it is the result of an hereditary predisposition transmitted to the spinal cord, and which materializes itself primarily by a vascular alteration. Dependent on the circulatory alteration there follows an atrophy of the organ, and, at the same time, a sclerosis.

The disease, in short, is a disorder of evolution, characterized by a special sclerosis occupying systemically certain determinate regions of the spinal cord.

THE CAPILLARY PULSE AND THE CENTRIPETAL VENOUS PULSE.

QUINCKE (*Berlin. Klin. Wochenschr.*, 1890, 265) formerly searched for the capillary pulse in the finger-nail, but found this method often unsatisfactory, on account of the lack of transparency. He therefore rubs the forehead with some hard, smooth body, as the lower end of the stethoscope, until a red spot is produced by the paralytic dilatation of the capillaries and smallest arteries. In this the systolic increase of the size of the redness can often be well observed. For the production of the pulse there should be the greatest possible difference between the arterial pressure during the cardiac systole and that during the cardiac diastole. The capillary pulse is best seen in aortic insufficiency, and depends on the amount of blood regurgitated as well as on the energy of the succeeding ventricular contraction. To permit of much aortic regurgitation, not only must there be extensive valvular insufficiency, but the ventricle must be able to contract; for if it be dilated and weakened, and unable to expel more than a portion of its contents, there is evidently not much room for regurgitation. Consequently, in disturbances of compensation in cases of aortic insufficiency, the characteristic peculiarity of the pulse often disappears; and it is only with return of ventricular strength that capillary pulse and the celerity of the arterial pulse can be discovered.

The capillary pulse is not observed in every case of aortic insufficiency, and conversely it may be witnessed in other conditions also, wherever the *pulsus celer* is found, as in anæmic and chlorotic conditions, and in many nervous and muscular alterations of the cardiac action. It may sometimes be seen in the everted under lip, or on pressing a plate of glass against the finger tip. In fact, a certain slight degree of external diastolic pressure favors the recognition of the phenomenon. It may even appear in the natural redness of the cheeks, and in any localized area of inflammation of the skin. The other conditions being present, it is especially well seen in erysipelas.

Pulsation of the retinal arteries is developed under conditions exactly similar to, though more complicated than those producing the capillary pulse.

Different from the conditions for the production of the capillary pulse are the circumstances under which the pulse-wave extends from the arteries into the veins, and the centripetal venous pulse is formed. The general opinion is that it is of rare occurrence, but the author disputes this, and says that he has seen it dozens of times. The chief conditions requisite for its occurrence are relaxation of the vessels, chiefly the arteries, but also of the capillaries and veins. This is especially common in certain stages of fever, as in sudden fall of temperature, accompanied by profuse sweat. Thus he has seen it in a

number of cases of typhoid fever, as also in recurrent and intermittent fevers, pyæmia, polyarthritis rheumatica, pneumonia, phthisis, and cholelithiasis. Nervous influences may join with the fever in producing it in such conditions, as meningitis, spondylitis, encephalomalacia, and injuries of the cervical cord. He has also seen the venous pulse in afebrile conditions, as chlorosis and anæmia, and even in healthy persons whose peripheral vessels have been relaxed by the summer heat. It is witnessed in the veins of the forearm and back of the hand. Only once has he seen it on the dorsum of the foot. Besides the relaxation of the vessels, a number of other conditions seem necessary for the production of the phenomenon; such as thinness of the skin, a sufficiently powerful action of the heart, a certain degree of fulness of the veins dependent on the relaxation of the vessel-walls and the position of the arm at the time of examination. A slight change in the position of the member may be sufficient to cause the pulse to disappear. One must not expect to find the capillary pulse in every case of centripetal venous pulse; on the contrary, their combination is exceptional.

Though the later stages of fever are favorable to the production of the venous pulse, the condition which develops it to the best advantage is the combination of aortic insufficiency with relaxation of the vessels. Arterio-sclerosis, also, may favor its occurrence, by transmitting a powerful pulse-wave into the smallest arteries. Venous congestion has not been, in his experience, liable to produce it.

SURGERY.

UNDER THE CHARGE OF

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PULSATILE EXOPHTHALMOS.

LEFORT (*Revue de Chirurgie*, June 10, 1890), in an exhaustive article upon pulsatile exophthalmos, to which are appended a bibliography and a complete list of cases, summarizes the subject as follows:

Pulsatile exophthalmos is an affection characterized by prominence of the eye and pulsations perceptible on palpating either the eyeball or the orbit. These pulsations are isochronous with the arterial beat, are accompanied by a bruit de souffle perceptible over a rather extensive area, and by intra-cranial bruits which are perceived by the patient.

The affection may originate in an aneurism of the ophthalmic artery or of the internal carotid, or in a phlebitis of the cavernous sinus, but is most frequently caused by a rupture of the carotid artery into the cavernous sinus. The abnormal development of the ophthalmic vein, to which the pulsations of the carotid are transmitted, is the principal lesion, in the sense that it is this which causes the principal symptoms.

The affection is either spontaneous or traumatic. If spontaneous it is found much more frequently in women than in men, and corpulence exercises a decided predisposing influence. When traumatic it most frequently follows violence to the head, even though it is impossible in many cases to determine the existence of a fracture at the base of the skull which may have directly caused a rupture of the carotid.

In the spontaneous cases the onset is frequently sudden, and the disease is well established in a few days with all its symptoms. Traumatic cases are frequently gradual in onset, and the principal symptoms are not perceived for some time after the infliction of the injury.

In addition to the classical symptoms of the affection must be enumerated diplopia, loss of vision on the affected side, conjunctival injection, chemosis, paralysis of the muscles of the eye, ptosis, enlargement of the palpebral and peri-orbital veins, and the existence of a pulsatile tumor at the internal angle of the orbit.

Cricoid aneurism, angiomas and vascular tumors of the orbit accompanied by prominence of the eyeball, by bruit de souffle, and by intra-cranial murmurs may readily be confounded with pulsatile exophthalmos. They are distinguished by three important characteristics:

1. The pulsatile peri-orbital vessels are arteries and not veins.
2. The maximum of pulsation is without and not within the globe of the eye.
3. If a pulsatile tumor exists it is found upon the outer and not upon the inner side of the orbit.

Pulsatile exophthalmos does not quickly result fatally. The patient has a prospect of at least some years of life. The symptoms, however, are very distressing, particularly the intra-cranial bruit, so that the sufferers are quickly driven to seek surgical aid.

In regard to treatment, direct compression upon the eye and subcutaneous injections of ergotine are useless. Intra-orbital coagulating injections are dangerous. Digital or instrumental compression of the carotid ameliorates for a time the principal symptoms, but it has practically resulted unsuccessfully when employed as a curative measure. Ligature of the primitive carotid is the only efficient treatment for a pulsatile exophthalmos. It is rarely followed by the cerebral complications so common when carotid ligature is employed under other circumstances. Nearly always ligation at once arrests pulsation and intra-cranial bruit. Frequently, however, these symptoms recur with lessened intensity some minutes, hours, or days after the operation. This apparent recidity is not of serious moment, since cure frequently results; sometimes in a few hours, sometimes not for months. If the exophthalmos is double, or if there is recidity in the case of unilateral exophthalmos treated by ligature of the carotid, the surgeon should not hesitate to ligate both carotids.

THREE CASES OF FRACTURE OF THE SIXTH CERVICAL VERTEBRA.

The attention which has been recently paid to spinal surgery, and the conflicting opinions advanced in regard to the propriety of operation in cases of fracture of the vertebræ followed by paralysis, make the report of the three following cases by DR. W. S. ENGLAND (*Montreal Medical Journal*, June, 1890) particularly interesting:

The first patient fell a distance of thirty-five feet. There was complete sensory and motor paralysis of the trunk below the arms, and paresis of the upper extremities. The patellar, cremasteric, abdominal, and ankle clonus were absent. There was no deformity of the back. The treatment was palliative. The patient died in two days. The autopsy showed fracture of the sixth cervical vertebra, compression of about half an inch of the cord, separation of the posterior ligament for about an inch, and hemorrhage into the cord.

The second patient fell on the back of the head and neck. The body was paralyzed below the arms, the symptoms were practically the same as in the former case. There was some priapism. On the day following the accident Dr. Bell operated with a view of removing pressure from the spinal cord if such pressure existed. Chloroform was administered to the patient, he was then turned on his face and the seat of operation properly prepared. An incision four inches long was made over the lower cervical vertebrae exposing the spinal processes and laminae. A fracture of the left laminae of the fifth and sixth cervical vertebrae was found. The right laminae were also cut by the bone forceps and the membranes were exposed. These appeared normal. The dura mater was then incised. A considerable quantity of reddish cerebrospinal fluid escaped.

The cord looked regular on its surface and there was no marked traumatism. The dura was then sutured and the wound was drained and closed. Death followed four days after the injury. Symptoms were but slightly, if at all, bettered by the operation. Post-mortem examination showed a portion of the cord, about three-fourths of an inch long opposite the sixth cervical vertebra, soft to the touch.

The third patient was injured by being caught in the belt of a rapidly revolving wheel. There was sensory and motor paralysis of the whole body below the third intercostal space. In addition to other fractures, including one of the pelvis, marked prominence of the sixth cervical vertebra was found. The following day an operation, similar to that done in the preceding case, was performed. About one inch of the cord substance was found very badly crushed. The wound was closed and drained. The patient lived three days after operation, and died comatose from respiratory failure.

Though neither of these cases was benefited by the exploratory incision, this latter seemed not to complicate the injury in any way. In both the cord was irreparably damaged at the moment of the infliction of the injury.

IODOFORM INJECTIONS IN COLD ABSCESSSES.

BRUNS (*La Mercredi Méd.*, April 16, 1890) states that iodoform is not efficacious in the treatment of tubercular ulcerations, because it is carried away by the secretions, and thus prolonged contact with the infected surfaces is not possible.

In cold abscesses, however, this condition is fully realized when iodoform injections are made. It is only after two months that the abscess cavity begins to retract, and the process is not completed for fully four months. As a vehicle olive oil is to be preferred to both ether and glycerin. The favorable action of such treatment is incontestable. Twelve tubercular abscesses

were cured, some of which contained from one to two quarts of pus, and during an observation of four years no case of recidivity was observed. In forty cases of tubercular arthritis this treatment gave a considerable number of apparently permanent cures, and other authors have reported analogous results.

Injection mixtures should contain ten or twenty parts of iodoform. If the disease is in its fungous stage an interstitial injection of four to six cubic centimetres is made. If there are peri- or intra-articular abscesses, these should be evacuated and the cavity should be injected. The preparatory boric acid irrigation, advised by Carousi, is not necessary, nor is immobilization of the joint required, save in exceptional instances. No case of intoxication was observed. These injections should be repeated every two or four weeks, sometimes they should be employed more frequently, an interval of not more than eight days being allowed to elapse between the treatments. As a result there is a rapid amelioration of pain. The purulent collections are at first reproduced but are subsequently absorbed. The fungosity gradually disappears, and, finally, the articulation remains normal and mobile.

Among the cures may be mentioned white swellings of practically all the joints, but particularly of the elbow, the knee, the wrist, and the ankle. Less common is the successful treatment of hip-joint involvement. The more recent the case and the younger the subject the better are the results. Even though a cure is not obtained a decided amelioration is always observed. Want of success in this treatment as applied to joint trouble is more common than is the case in cold abscesses. An extended experience in several large clinics has demonstrated that this treatment should be given a fair trial in the early stages of all white swellings.

Krause states that he has had only 3 failures in 36 instances where the knee was involved, 13 of the hip, 6 of the ankle, 5 of the hand, and 1 of the elbow. Complete cure has resulted, and there has been no return of trouble for one year in 15 of the knee cases, 4 of the hip, 1 of the ankle, and 3 of the hand. Movement was especially well preserved in the knee and the hand. In the hip there was ankylosis, but all of these were well-advanced cases, and might have resulted more favorably had intervention been practised earlier. Trendelenberg has employed this treatment in 130 cases, the injections being repeated at intervals of eight days. The results varied. They were good in the hip and wrist.

THE RELATIONS OF SUBDIAPHRAGMATIC ABSCESS TO THE THORACIC VISCERA.

A paper upon this subject, with a report of three illustrative cases, is contributed by DR. J. WILLIAM WHITE (*British Medical Journal*, May 3, 1890).

The author points out the two weak places in the muscular membrane separating the thoracic from the abdominal cavities; anteriorly the space between the margin of the muscular fibres arising from the ensiform cartilage and the adjoining costal cartilages, and posteriorly the space beneath the arch of the internal ligament, under which the great psoas muscle passes. As a result of the anatomical relations of the diaphragm with the serous

membranes placed above and below it, it is by no means uncommon to find suppurative diseases traversing these boundaries, either by means of the weak points already described, or by setting up adhesive inflammation followed by suppuration. Circumscribed peritoneal abscesses frequently occupy the right and left hypochondriac regions, and in a large proportion of such abscesses the corresponding side of the thorax becomes affected. Pleurisy, pneumonia, pleuritic effusions, or empyema, may result, and the case is very likely to be mistaken for one of chronic pulmonary disease, whilst the abdominal trouble is overlooked. Pericarditis may be caused in the same way, though this is much rarer, and for the obvious reason that the opportunity for the spread of inflammation through this membrane by contiguity is less, in direct proportion to the extent of surface involved as compared to the pleuræ. Peri-nephritic abscesses are even more likely than those associated with the liver and spleen to be followed by thoracic symptoms, and this fact constitutes a distinct indication for early operation. The reasons for this liability to thoracic involvement are obvious: the superior portion of the kidney lies upon the diaphragm, the lower margin of which crosses the back of the kidney in a direction obliquely downward and outward. This relation of the diaphragm is also shown by the depression in the kidney, this organ descending nearly half an inch upon deep inspiration. The pleura on the upper surface of the diaphragm is therefore in close proximity to the upper posterior peri-nephritic region, and readily becomes, from contiguity of structure, involved in the inflammation. A case typical of this form of extension is detailed in full. From the development of the peri-nephritic irritation as a sequel to nephro-pyelitis subdiaphragmatic abscess resulted. This, in turn, was followed by localized pleuritis, which, in time, became diffuse, causing complete collapse of the lung. The fact that peri-nephritic abscess originated, in this case, in unmistakable suppuration of the pelvis of the kidney greatly facilitated the interpretation of the clinical history.

In several reported instances the pulmonary involvement has occurred so early, or the previous symptoms have either been so vague and insidious, or so inaccurately observed, that the empyema has been supposed to be the primary disease. In obscure cases it will often be found that a history of flexion of the thigh upon the pelvis, of pain in the loins, or, at least, of distinct lameness about the hip, will indicate the cause of the thoracic disease. Niemeyer has dwelt upon the value of the position of the thigh as evidence of the perforation of the pelvis of the kidney and involvement of the connective tissue. One of Dr. Bowditch's cases strikingly illustrates the importance of these symptoms. He was called to see a patient who was supposed to be dying of phthisis, and who was expectorating large quantities of pus. There was complete dulness over the lower lobe of the right lung with bronchial breathing and coarse râles. The attitude of the patient was peculiar. He seemed to be sitting on one gluteus in order, apparently, to relieve the other. A history of lameness, together with pain in the right loin, of three months' duration, was elicited. The lumbar fold of that side was found obliterated. On this evidence an incision was made, pus was reached, and the patient made a good recovery. It should never be forgotten in such cases that the thoracic complications are not only the most frequent, but also the most

important, coming on in so insidious and latent manner, they should always be sought for, even when the symptoms point exclusively to the abdomen, because the fact of the existence of abnormal thoracic signs has an important bearing on the treatment and prognosis of every case of peri-nephritic abscess. On the other hand, the thoracic symptoms may completely mask the renal.

There are on record several examples of perforation of the diaphragm in an inverse direction—that is, of empyemata becoming subdiaphragmatic or lumbar abscesses. Cases taken from the author's private experience, and collected from the meagre literature of this subject, are detailed in illustration of the statements above cited.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
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LARYNGECTOMY.

DR. BARDENHEUER, of Cologne, in an article on Extirpation of the Larynx (*Deutsche med. Woch.*, May 22, 1890), states that but one case out of his first five was saved, the remainder having died between the eighth and fourteenth days or later, from septic inflammation, usually starting at the deepest portion of the wound, in the space between the trachea and the overlying musculature. This was the consequence of failures in antisepsis, either during the operations or in the course of the after-treatment.

In four more recent operations, three complete and one partial laryngectomy, he has pursued a modified plan of preparation, operation, and after-treatment, which has prevented infection from the mouth and from the wound. All four patients recovered, although one of them died of severe bronchial blennorrhœa six weeks after operation, and after the wound had cicatrized. He cleanses the mouth repeatedly for several days before the operation, using the toothbrush, and wiping the mucous membrane with dry salicylated wadding. In operating, he uses the Trendelenburg tampon canula, armed with iodoformed sponge. He makes two large lateral four-cornered flaps to afford free access to the field of operation. The wound cavity is plugged with iodoform gauze. He places the patient in such a position that the head is thrown entirely backward, and the stump of the trachea forms the uppermost portion of the wound cavity, while its triangular base looks upward and backward. The patient lies in a bed made with a mattress in three portions. The upper portion is removed and the patient's head sinks down in the space it occupied, the shoulders striking the upper portion of the middle section of the mattress. In this manner the secretions can neither accumulate in the neighborhood of the trachea nor enter it. Furthermore, he forms a partition wall between the

mouth and the wound cavity, covering the latter as a roof. He takes care to spare as much as possible the anterior wall of the œsophagus and the mucous membrane underneath the epiglottis; and after completing the operation he stitches the edges of this spared mucous membrane underneath the epiglottis to that of the anterior wall of the œsophagus from before backward, even cutting the epiglottis somewhat at its free border and stitching the edges of the wound to those of the œsophagus. This cuts off the cavity of the wound from that of the mouth, and from particles of food. The cavity of the wound is firmly plugged with sterilized gauze, and the patient is first bandaged at a period varying from two to eight days, often only after the entire cavity is covered with good granulations. The time for changing the dressing depends chiefly on the holding of the stitches. If they hold well, a change will not be necessary for eight days. The advantage of this procedure is that the patient can swallow from the first, and does not require to be fed with a tube. At the end of fourteen days, if the stitches have not given way spontaneously they can be removed. In one instance it was found necessary to reëstablish artificially the communication between the mouth and the cavity of the wound. After removal of the stitches, the two lateral flaps can be replaced.

OBSTETRICS.

UNDER THE CHARGE OF

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THREE CASES OF ECTOPIC GESTATION.

DUNCAN (*Lancet*, March 1, 1890) reports a case of tubal gestation of the left side in which rupture occurred between the layers of the broad ligament. On admittance to hospital the patient's temperature was 101.8°; she was too ill to give a clear history. On examination a firm swelling was found to the right of the linea alba, extending nearly to the umbilicus, its lower end in the pelvis; to the left of the linea alba was the bladder, and on deep palpation a firm mass was felt in the left half of the pelvic cavity. On internal examination a swelling filled up Douglas's cul-de-sac; the patient became extremely ill, her temperature rising to 103°. On abdominal section ruptured tubal gestation in the left broad ligament was found; the tumor was adherent to the omentum, intestines, and pelvic wall. The patient collapsed, and the uterus, ovaries, and tumor were rapidly removed. The patient, however, survived the operation but a short time; the left tube had contained a gestation sac which had ruptured into the broad ligament.

His second case was right tubal gestation, in which examination showed a firm mass in the region of the broad ligament. On abdominal section the pelvis was found filled with blood; the right ovary and tube were separated

from adhesions; the tube had ruptured; the broad ligament was transfixed and the ovary and ligament removed; clots were emptied and the abdomen closed.

Examination of the specimens demonstrated the rupture in the tube, and also the foetal membranes and the enlarged ovary; two pints of blood were removed. The patient's convalescence was disturbed by a mass at the right of the uterus, which gradually disappeared.

A third case is reported, in which an abdominal tumor was found, which presented, on auscultation, a bruit; on abdominal section a small tense cyst was found to the left of the uterus between the layers of the broad ligament; this cyst extended to the pelvic brim, to which it was adherent, and contained a foetus ten and a half inches long. Profuse hemorrhage occurred from the incision in the cyst wall; the edges of the opening were sutured to the lower end of the abdominal incision, and a drainage-tube inserted; sponges wrung out of vinegar and water were passed into the cyst to stop hemorrhage. On one occasion, after dressing the cyst, profuse hemorrhage occurred, which was stopped by the injection of iron. The umbilical cord, with pieces of placenta, was gradually removed, and the rest of the placenta followed. The patient had a long and tedious convalescence. The retained placenta decomposed very offensively, and her recovery was further complicated by a faecal fistula at the upper portion of the cyst. Recovery finally occurred with closure of the fistula.

Duncan would open the abdomen for all cases of ectopic gestation except those in which rupture has occurred in the broad ligament. If the foetus dies, and the tumor becomes encysted, hemorrhage does not occur, and it is finally absorbed.

EIGHT CASES OF ECTOPIC GESTATION TREATED BY LAPAROTOMY.

OLSHAUSEN (*Prager medicinische Wochenschrift*, No. 8, 1890) reports eight cases of ectopic gestation in which he operated by laparotomy as follows: The first was ectopic gestation, foetus perished at seven months, the mother suffering from fever, the diagnosis plain; the foetal sac was stitched to the wall of the abdomen, and the placenta separated, when hemorrhage occurred necessitating the immediate use of the tampon; eleven days afterward the placenta came away without hemorrhage; the sac rapidly closed with suppuration.

In the second case, the foetus died at eight months; operation was delayed ten weeks afterward, the sac stitched to the abdominal wall; the placenta separated spontaneously, was very thin and widely spread out, and its separation was very tedious.

The third case came under treatment four months pregnant, and a diagnosis of ectopic gestation was made. Laparotomy was performed fourteen days before the end of pregnancy; the sac was sutured; the living child removed, but perished an hour and half later of exhaustion. The placenta was left, and separated thirty-four days afterward. Recovery was complicated by eclampsia, which was found to be a psychosis lasting fourteen days. This was followed by a brief period of unconsciousness; capillary embolism of the lungs also occurred, from which the patient recovered. Six weeks before

the termination of pregnancy a discharge from the vagina had persisted; this was diagnosed as amniotic liquid which flowed through the median portion of the Fallopian tube; this diagnosis was confirmed at the operation by an entire absence of amniotic liquid; as a consequence the delivery of the child through the uterine incision was as difficult as in a case of highly contracted pelvis. This is the only case on record where such discharge of amniotic liquid has been observed.

In the next case pregnancy was at fourteen months; the fœtus four months dead, diagnosis was difficult and uncertain; laparotomy was made and the fœtus removed. The patient had fever in the second week, and a recto-vaginal fistula formed which soon healed spontaneously.

The fifth case was operated on shortly before the end of pregnancy; the fœtus could be outlined, but no fœtal sac demonstrated. In a few days the contour of the abdomen changed greatly; it became wider in its transverse diameter, caused by rupture of the fœtal sac; six days afterward laparotomy was performed. On opening the abdomen the fœtus was found at the posterior wall of the abdomen, living and lying loosely among the coils of the intestines; the child was strong and lived and thrived. The same woman had been operated upon by Olshausen before for ectopic gestation in the left tube. The fœtal sac and placenta were upon the broad ligament; they were tied off *en masse* by three ligatures and removed; recovery followed.

The sixth case was laparotomy at twelve months pregnancy; the fœtus dead four months; extirpation of the sac; recovery.

In the seventh case the diagnosis was incorrect; a tumor was found on the right side of the uterus, and thought to be a foreign growth; the patient was excessively debilitated. On laparotomy, the fœtal sac burst, and a six months fœtus was removed; the sac was extirpated and recovery followed. The fœtus had died five months previously, and the history was most confusing.

The last case was pregnancy at ten months, the fœtus dead ten weeks. The fœtal sac was found ruptured and in halves, one containing the fœtus, the other the placenta, which was heavier and larger than the child. Both halves were extirpated. The child was not decomposed although dead ten weeks.

The first three cases were treated by suturing the sac to the abdominal wall, leaving the placenta twice, removing it once.

In the five other cases, the sac was extirpated with or without the placenta; serious hemorrhage was never observed.

Olshausen describes two cases of sudden death caused by rupture of the fœtal sac. When the sac is not intra-ligamentous, it should be extirpated without waiting, but as soon as a diagnosis is made. When suppuration has occurred in the sac, it should be stitched to the abdominal wall, disinfected, and tamponed if necessary; such suppuration is generally caused by micro-organisms from the intestinal canal. If the sac cannot be extirpated, the placenta is so situated that there is risk of its infection by microorganisms from the intestinal canal. In the treatment of lithopædia, when complete calcification of the fœtus has occurred, there is little danger of suppuration; until, however, this process is complete, suppuration may occur at any time, no matter how long the case has persisted, the fœtus should be removed.

THROMBUS OF THE VAGINA DURING LABOR IN A HÆMOPHILIAC, WITH
PULMONARY EMBOLISM.

LOVIOT (*Bulletins et Mémoires de la Société Obstétricale et Gynécologique de Paris*, No. 4, 1890) reports the case of a woman delivered of her second child who had a family history of hæmophilia; her labor, which was normal, was terminated by an easy application of the forceps, and the delivery of a living child. Hemorrhage followed delivery, although the uterus was well contracted.

On examination a vaginal thrombus was found the size of half an orange at the right side, and a little behind the cervix uteri; a sensation of arterial pulsation could be distinctly obtained from the thrombus; twenty-five days after labor the patient was taken with symptoms of pulmonary embolism, rapid small pulse, short and frequent respiration without physical signs of pneumonia. The patient had against orders left her bed and had moved about rapidly for a short time; she was put immediately at absolute repose, given inhalations of oxygen, stimulants and dry cups; symptoms of pneumonia complicated by pleurisy subsequently appeared, from which the patient gradually recovered. Two months after delivery she was in fair health with only a slight scar at the site of the thrombus.

HEMORRHAGIC METRITIS, RETENTION OF THE PLACENTA FOR SIX
MONTHS.

DE LOSTALOT (*Nouvelles Archives d'Obstétrique et de Gynécologie*, December 20, 1889) reports the case of a woman who had suffered for six months after an abortion from hemorrhagic metritis; on examination the cervix was found congested without cervical metritis; the body of the uterus was in normal anteversion, but enlarged and softened; after the use of the curette a number of spongy fragments were removed, which, upon microscopic examination, were found to be a placenta corresponding to the period of the abortion: six days after emptying the uterus, the patient had a rise in temperature which yielded promptly to intra-uterine injections of bichloride of mercury.

In addition, CHAPUT (*Ibid.*) reports two cases of adherent placenta, in one of which the placenta remained two months in the uterus; in the other the fœtus and its appendages were retained two months; in each case artificial removal was resorted to. Upon microscopic examination of the specimens, the tissue of the placenta was found sclerotic with patches of hemorrhagic infiltration; the number of villi was considerably reduced, although the volume of each villus was greatly enlarged; at the periphery of the villi a circle of small epithelial cells was found with small nuclei; there was no trace of bloodvessels in this tissue. The great mass of placental tissue was formed by fibrous connective tissue staining imperfectly with picro-carmin; in the villi the cells were elongated with small nuclei and stained poorly; they resembled most atrophic cartilage cells found upon foreign bodies free in the joints; in the large villi were found masses of very large cells resembling decidual cells; they stained feebly a rose color, and were granular in appearance; blood was also found in the dilatations of the bloodvessels. The conclusion is reached that after abortion, the fœtus expelled alive, the placenta may continue to live; the bloodvessels are gradually obliterated and

replaced by connective tissue; atrophy of the cellular elements ensues; when this tissue of low vitality perishes either hemorrhage or septic infection is apt to occur.

HORSE-SHOE KIDNEY IN THE NEWBORN INFANT.

ARBEL (*Bull. et Mém. de la Soc. Obstét. de Paris*, No. 4, 1890) reports the case of a prematurely born child at seven months, in which upon post-mortem examination a horse-shoe kidney was found reaching as low as the border of the second sacral vertebra; the kidney had two ureters which led in the usual manner to the bladder.

The Reporter, in a recent post-mortem upon a young infant, found a kidney similar to that described by Arbel. In this instance, the vinculum connecting the two halves of the kidney was as wide as either of the halves, and the organ was composed of three lobes, two representing the kidney as usually found, and the third the vinculum between the two halves; two ureters were present, as in Arbel's case.

INDUCED ABORTION AT 132 DAYS' PREGNANCY, FOR PERNICIOUS VOMITING; RECOVERY.

LOVIOT (*Bull. et Mém. de la Soc. Obstét. de Paris*, No. 1, 1890) reports the case of a primipara, aged nineteen years, pregnant between four and five months, in whom all methods of treatment failed to stop pernicious vomiting; the patient was fed for six weeks by rectal injections, her temperature remaining slightly below the normal, her pulse was above 120; abortion was produced by the introduction of a bougie into the uterus which resulted in the expulsion of the fœtus and appendages. Shortly after delivery the patient enjoyed and retained a meal of beefsteak and potatoes.

DEXTRO-TORSION OF THE PREGNANT UTERUS SIMULATING EXTRA-UTERINE PREGNANCY.

WENNING (*American Journal of Obstetrics*, No. 2, 1890) reports a case presenting the clinical signs of an ovarian or abdominal pregnancy with discharge of membranes from the uterus. The sound was repeatedly passed into the uterus, which seemed empty. Fœtal heart sounds were heard in the tumor, which was at the right of and below the umbilicus. Efforts were made to destroy the fœtus by electricity and aspiration of the liquor amnii, but without success. As vomiting, pain, and prostration continued, relieved only by morphine, laparotomy was done, when a pregnant uterus at six months was found strongly twisted to the right. The left tube was much enlarged, swollen, and dark. Premature labor followed, and death from septic peritonitis. An old inflammatory band was found passing from the cæcum to the small intestine, on post-mortem examination.

A CASE OF FIBRINOUS PNEUMONIA OF CONGENITAL ORIGIN.

LEVY (*Journal des Connaissances Médicales*, January, 1890) reports the case of a woman, aged thirty years, who had died of double fibrinous pneumonia complicated by pleurisy and pericarditis. The chest was aspirated, and a

sero-purulent fluid removed which gave cultures showing the diplococcus of Fränkel and Weichselbaum. Inoculations were made with this fluid, which demonstrated the presence and potency of the germ. The child of this woman, born thirty-six hours before its mother's death, died two days after birth of hemorrhagic catarrhal pneumonia with lobar fibrinous pneumonia, and the autopsy demonstrated the fact that the pneumonia from which the child died was infectious, and had persisted for at least thirty-six hours before the child was born. Cultures made with fluid removed from the left ventricle of the heart, and from the right lung, demonstrated the presence of the diplococcus; the microorganisms were especially numerous in the blood, and the conclusion is drawn that the infant became infected from the mother's pneumonia.

THE TRUE CONJUGATE DIAMETER OF A CONTRACTED PELVIS VARIES
WITH THE POSTURE OF THE PATIENT.

WALCHER (*Centralblatt für Gynäkologie*, No. 51, 1889) has found in examining a number of contracted pelvises, that when the patient is placed upon the back, the upper portion of the body elevated as little as possible, the thighs flexed upon the abdomen, the promontory of the sacrum is easily reached; by an examination with the finger in these cases, the antero-posterior diameter measured less than four inches; but if a cushion be placed under the sacrum, and if the thighs were extended upon the table, it was found that an increase in the antero-posterior diameter occurred, which, although slight, was sufficiently great to be an important factor in difficult labor. The explanation of this phenomenon is supposed to be the mobility of the sacral joints during the latter portion of pregnancy.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

VAGINAL FIXATION OF THE RETROFLEXED UTERUS ACCORDING TO
SCHUCKING'S METHOD.

DEBRUNNER (*Correspondenzblatt für Schweizer Aerzte*, June, 1890) reports twelve cases in which he performed this operation. The uterus was movable in each instance, but it was impossible to retain it in position by a pessary. The operation was followed by no bad results, except in two cases in which the bladder was punctured, when temporary hæmaturia and vesical tenesmus were noted. Eight patients were cured, one having since borne a child at full term; in four cases there was no result whatever, and in four others the displacement recurred within a few weeks. Three cases of ventro-fixation

were successful. Both methods have their proper place, the former being unsuited for those cases in which the uterus is large and heavy. The advantage of the vaginal operation is that there is a minimum of pain and danger, and the patient is confined to her bed but a short time, being able to return to her work at an early day.

PAPILLOMA OF THE FALLOPIAN TUBE.

DOLÉNS (*Revue Obstétricale et Gynécologique*, May, 1890) describes a specimen of this rare disease, which he removed by laparotomy, which gave rise to a peculiar clinical symptom—periodical hydrorrhœa of undoubted tubal origin. Anatomically the growth appeared to be a pure papilloma of a benignant character, due to chronic inflammation of the tubal mucosa.

LAPAROTOMY IN TRENDELENBURG'S POSTURE.

In a letter to the *Archives de Tocologie* VEIT states that he has during the past two years invariably placed his patients in this position during laparotomy. The advantage obtained is unusual clearness of the field of operation, since the intestines gravitate downward toward the thorax, while intrapelvic tumors in their turn become more accessible to the operator. The writer has never seen disadvantage from the peculiar position in the way of interference with respiration. In general, the duration of his operations has been much shortened since he adopted this method.

THE LOCAL TREATMENT OF CHRONIC ENDOMETRITIS.

DUMONT-PALLIER made a further communication to the Académie de Médecine on this subject (*L'Abeille Médicale*), his conclusions being as follows:

1. The best method of treating chronic endometritis is to introduce a pencil of chloride of zinc into the uterine cavity, where it is allowed to dissolve.
 2. No inflammatory complications result from this treatment, and the pain is not insupportable.
 3. The endometrium is soon restored after the operation, and normal menstruation returns within a few weeks.
 4. By systematic dilatation stenosis can be prevented.
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THE TREATMENT OF PROLAPSUS UTERI BY BRANDT'S METHOD.

BRAUN and KREISSL, in a recent monograph on pelvic massage (abstracted in *Frauenärzt* for May, 1890), report fourteen cases of prolapsus treated by this method, with four cures. They call attention to the cause of failure in the unsuccessful cases, which they attribute rather to injury of the pelvic floor than to relaxation of the so-called ligaments of the uterus. In order to obtain permanent relief from pelvic massage it is necessary that the pelvic floor should be only relaxed, without having lost its tone, and that the vaginal walls should be normal, hence in old patients whose muscles are completely atrophied, a favorable result cannot be expected. If the muscles are felt to contract during the movements, a good prognosis can be given as regards permanent restoration of the uterus to its normal position. Laceration of the

perineum, pelvic inflammation, and exudates and tumors are absolute contra-indications so far as the treatment of prolapsus is concerned. The writers speak highly of the value of massage in the treatment of pelvic exudates, reporting twenty-four cases with twenty cures.

ONE HUNDRED ASEPTIC LAPAROTOMIES.

PHENOMENOV reports one hundred cases of laparotomy performed by him during the scholastic seasons of 1887, 1888, to March 3, 1890.

The causes of operations were—

Ovarian cysts	47
Tubo-ovarian cysts	2
Cysts of broad ligaments	6
Diseased tubes, tubes and ovaries, perisalpingitis, and perioöphoritis	9
Malignant neoplasms of ovaries	6
Swelling of ovaries	3
Myoma of uterus	17
Myoma and cancer of uterus	1
Swellings outside of genital sphere	3
Irreducible hernia of the cord (navel, in a newborn child one hour old)	1
Extra-uterine pregnancy	3
Pregnancy in horn of uterus	1
Complete prolapse of uterus	1

The following operations were performed:

Ovariectomy	61
Single 22, double 39	
Removal of appendages	15
Single 12, double 3	
Myomotomia	10
Extrauterine pregnancy	3
Complete removal 2, partial 1	
Amputation of gravid uterus	1
Excision of hernia in newborn	1
Colpolaparohysterectomy	1
Ventro-fixation (and removal of appendages)	1
Removal of cyst of mesentery †	1
Removal of cyst of echinococcus	1
Exploratory	6

The heaviest weight of removed parts was 140 pounds (Russian weight).

The largest circumference of abdomen 152 cm.

Duration of operation: longest 1 hour 45 minutes; shortest 9 minutes (ovariectomy).

Ages: oldest 65 years; youngest 8 years; and one hour.

Five deaths.

After the removal of ovaries and appendages menstruation continues in

some even with the same regularity as before the operation. Several of the patients were under observation of the author for two years.

All operations in pregnant women were not followed by any complication. Pregnancy continued, and the labor was normal. (Author received several letters from patients to this effect.)

Several operations were followed by acute bronchitis on the second day, which ran its course without fever. The author does not ascribe it to the laparotomy proper, but to the effect of chloroform over the respiratory organs, as several cases of bronchitis followed other operations where prolonged narcosis was needed.

Mistakes in diagnosis: Myoma lymphangiectodes was diagnosed as ovarian cyst. Ovarian fibroma was mistaken for a doubtful ovaritis or dermoid cyst. Pregnancy of horn of uterus was mistaken for extra-uterine.

From January 1, 1889, all operations were conducted without the use of antiseptics (83 cases). Sponges, instruments, silk, towels, etc., were boiled in distilled water. Only two sponges were used, one for operator and the other for assistant; when they got soiled they were washed in hot water from a boiling samovar.

Hands of operator and assistant, and abdomen of patient, were cleaned with soap, brush, and hot water. Just before the operation the field was washed with ether.

The absence of fever, the healing of the wound, and the absence of any irritation, prove that the operation was thoroughly aseptic. The sponges and the silk were subjected to a bacteriological examination, and were found free from bacteria.

"The idea of performing laparotomy only aseptically occurred to me long ago—indeed, when I first undertook the operation. To tell the truth, the first aseptic operations were performed secretly; not even all the assistants were aware of it. This was done, of course, not for fear of censure, but with a view not to discredit this mode of operation, should the first attempts prove unfavorable. Surgical operations are so intimately connected with antiseptics in the mind of the profession, the more so in such dangerous operations as laparotomy, that it was difficult to expect any welcome to a new method which intruded into the realm where antiseptics reigned supreme."—*Fratch*, Nos. 16, 17, 18, and 19, 1890.

PAPILLOMA OF THE PERITONEUM.

SUTUGIN (*Centralblatt für Gynäkologie*, June 7, 1890) calls attention to the difficulty of distinguishing this condition clinically from cancer and tuberculosis of the peritoneum, which are also accompanied by chronic peritonitis and ascites. The absence of distinct, hard nodules, and the uniform induration of the vaginal vault, point rather to papilloma. Coblenz has noted a peculiar rubbing sensation on palpating the abdomen, though this appears to be more characteristic of a papillomatous cystoma rather than of peritoneal outgrowths. As the latter are secondary, and are of themselves not so prone to proliferate, the removal of the parent cyst and of a portion of the peritoneal masses, offers a fair prospect of cure, and seems to show that, at least

clinically, there is some doubt if true papilloma should be included in the same class with sarcoma and carcinoma.

EMISSIONS IN THE FEMALE.

ROBINSON (*Med. Age*, 1890, No. 7) calls attention to the fact that under the influence of erotic dreams there occurs a profuse secretion from Bartholin's gland which is similar to nocturnal emissions in the male. The patient after such a discharge frequently awakens in the morning with backache and a feeling of malaise. At the moment of emission there may be a painful spasm of the constrictor cunni muscle. Self-abuse, imperfect coitus, sudden suspension of sexual relations (as in young widows) are the usual etiological factors. If the emissions continue the patient becomes neurasthenic. The treatment consists in improving the general condition, toning up the nervous system, and regulating the sexual hygiene.

PÆDIATRICS.

UNDER THE CHARGE OF

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A. F. CURRIER, M.D.,

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AND

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STERILIZATION OF MILK.

CHAPIN (*Medical Record*, June 21, 1890). The method of sterilizing, as between boiling and steaming, is a point of some interest. Prolonged boiling of milk, while destroying the germs, produces other changes, such as the formation of a scum in contact with air, consisting of coagulated albumin with a small modicum of fat. According to Dr. Townsend, boiling expels about three per cent. of CO₂, N and O, which may explain the flat taste of milk so heated. Sterilization by steam appears to be more thorough and complete than that effected by boiling in water. For the past year, Dr. Chapin has used the "Arnold" steam cooker, with much satisfaction. The printed circulars advise that the milk be heated from 30 to 45 minutes. This is too short a time; fully an hour and a half is needed to keep milk sweet for any length of time.

Dr. Chapin's experiments showed that the prolonged heat necessary for thorough sterilization has a tendency to cause the coagulation of the casein to take place in smaller clots and thus more closely resemble that of mother's milk.

ADENOID TUMORS OF THE NASO-PHARYNX IN CHILDREN.

CHAUMIER (*Le Concours Méd.*, March 22, 1890). In children seven or eight years of age these tumors are of frequent occurrence. At the age of eighteen

or twenty they tend to disappear spontaneously. They are not due to scrofula, and it is questionable whether microorganisms have anything to do with their causation. On this latter point nothing definite is known. It is possible that heredity may have something to do with their etiology. Of 232 cases which the author had seen, the ear was affected in 31, and manifest deafness was present in 24 of that number. In 9 there was chronic otorrhœa, and in 9 others a catarrhal discharge. The author feels that deafness in children, in general, may be associated with adenoid growths, and the same is true of most of the chronic catarrhs of childhood. Mouth-breathing is another symptom in such cases, which is frequently observed. Other symptoms are arching of the palate to an unusual extent, and thickness of the upper lip. In 75 of the cases seen by the author, the tonsils were sufficiently large to require excision. In 28 cases there were large adenoid granulations on the bucco-pharyngeal mucous membrane. In 16 the cervical glands were enlarged. Respiration was constantly interfered with from nasal obstruction, with hypersecretion of mucus. There are three forms of complication to which too little attention has heretofore been given, namely, laryngo-bronchial accidents, nocturnal terrors, and angina. In cases in which cough is a symptom, there may also be paroxysms of suffocation of asthmatic character, which are especially prone to occur at night. Nocturnal terrors in these cases are the result of respiratory trouble during the hours of sleep. Angina is very common, but is often so mild as to escape the attention of parents. Adenoid tumors may be of grave significance, since they may lead to loss of hearing, arrest of intellectual development, and deaf-mutism. They may even cause death by the propagation of purulent inflammation from the ear to the brain. Bronchitis is frequently due to this cause. Such tumors should, therefore, be sought for in all children who are mouth-breathers; in those who have catarrhal discharges from the ear; in those who are deaf; in those whose articulation is defective; in deaf-mutes, idiots, and backward children; in those who are subject to bronchitis and asthma; and in those who suffer from nightmare. Posterior rhinoscopy will reveal the presence of the tumors, and digital examination of the naso-pharynx will enable one to feel them. With very young children, however, rhinoscopy will be difficult or impossible. The treatment consists in the destruction of the tumors with cutting forceps or adenotomes, or they may be scraped away with the finger or curette. The nasal douche may also be used, especially if there is trouble with the Eustachian tubes. During the night after the first treatment it is not unusual that there should be paroxysms of cough or suffocation.

CLINICAL OBSERVATIONS ON THE TREATMENT OF RHACHITIS WITH SMALL DOSES OF PHOSPHORUS.

MANDELSTAMM (*Jahrb. f. K.*, xxx. 4). The following conclusions are offered:

1. Clinical observation justifies the treatment of rhachitis with small doses of phosphorus.
2. Phosphorus acts upon the rhachitic process better, quicker, and more safely than any other agent.
3. The use of phosphorus in small doses for a long period of time is well tolerated by children, and causes no perceptible disturbance.

4. Phosphorus acts satisfactorily upon the nervous disorders which accompany rhachitis, such disorders disappearing quickly, and the general condition improving rapidly.

5. Periodical measurements and weighings of rhachitic children treated with phosphorus, as well as investigation of the condition of the bones, show that under the influence of this agent the rhachitic process usually ceases to progress, the disease gradually disappearing.

INFLUENZA IN CHILDREN.

KORMANN (*Wien. med. Blätter*, Nos. 51 and 52, and *Rev. Mens.*, April, 1890). There are certain essential differences in the symptoms of this disease as it appears in children from that form which is seen in adults. With children fever and cerebral symptoms at the beginning of the disease are of primary significance. Rudimentary forms may be manifested by general malaise, lassitude, want of activity, and disinclination to play. In well-developed cases the disease usually begins abruptly the same as in adults, but instead of well-marked chills there are usually only chilly feelings alternating with feelings of heat. The chilliness may be accompanied with convulsions, and the latter be succeeded by drowsiness which may last twenty-four hours or more. When very young children have this disease they are apt to be fretful and complain whenever any change is made in their position. Older children complain of pains in the head, the lumbar region and the limbs, and there may also be intense mental dulness, which may even extend to loss of consciousness. Other symptoms are loss of appetite, paroxysms of cough, vomiting, or diarrhoea. In grave cases death may occur within forty-eight hours. In the majority of cases the pathological process is limited to the mucous membranes, the respiratory passages being first attacked, after which may follow conjunctivitis, epiphora, difficulty in deglutition, deafness, and possibly cough. In very young children there may be dyspnoea of an alarming character. There is usually swelling of the cervical ganglia. Psychological excitation characterizes some cases, while with others there is depression. The nervous symptoms are apt to improve after three to six days. A crisis in the disease may be marked by sweating, and instead of the dry cough there may be expectoration of mucus. Convalescence is slow, lasting eight or ten days. Complications during the disease, or during convalescence, are more common in children than in adults. There may be chronic bronchitis, caseation of the bronchial glands, acute miliary tuberculosis and tubercular meningitis. Of the acute complications the most common are pneumonia and croupous bronchitis, which are ushered in by chills, and sometimes by convulsions in addition. The mucous membrane of the nose is usually hyperemic, and may have a grayish deposit adherent to it. The same condition may involve the entire bucco-pharyngeal mucous membrane, and may even extend into the bronchi. There is rarely any extensive morbid change in the organs of the digestive apparatus, but a catarrhal swelling of the mucous membrane of the stomach is common enough. There may also be swelling of Peyer's patches and the closed follicles. The spleen is usually not swollen. Disorders of the nervous system are more marked with children than with adults in this disease. The hyperæmia of the Schneiderian mem-

brane may be responsible for severe pain in the head. Hyperæsthesia may be present upon the face or scalp, or it may include the entire surface of the body. There may be local or general convulsions and trembling of the tendons and of the extremities. Cutaneous phenomena may be urticaria, the exanthem of scarlatina, rubeolous spots, and erythemata due to vasomotor trouble. Dyspnœa may be intense, and not related to lesions of the bronchi, but to neuroses of the bronchial muscular fibres and the diaphragm. It may be of a paroxysmal, intermittent character, perhaps amounting to orthopnœa, with intense præcordial anxiety. In some cases there is a predominance of gastro-intestinal troubles. The prognosis will vary with the character of the epidemic, but it may be considered grave, in general, for young infants. The treatment should be symptomatic, especial attention being paid to the general condition, and to the relief of catarrhal difficulty.

HEMIPLEGIA IN CHILDREN IN CONNECTION WITH PNEUMONIA OF THE APICES.

AUFRECHT (*Rev. mens. des Mal. de l'Enf.*, May, 1890). Two cases of this character were observed. The first occurred in a boy fifteen months old, the upper lobe of the right lung being affected. On the eighth day there was a right hemiplegia, which disappeared entirely in fifteen days. The second case was in a girl two years and three months old, the pneumonia involving the left apex. There were severe convulsions at the beginning, which were followed by hemiparesis of the entire left side, but the paralysis lasted only a few hours. Lepine believed that pneumonic hemiplegia occurs almost exclusively among the aged, and he attributes it to an atheromatous condition of the vessels, the paralysis being consecutive to ischæmia of the central nervous system. Atheroma of the cerebral vessels may predispose to the ischæmia, and also reflex action proceeding from the pneumonic process in the lung. Stephan has seen pneumonic hemiplegia in those whose arteries were not atheromatous, hence atheroma cannot be a universal cause. If there is no anatomical change in the brain and meninges, he believes that the hemiplegic pneumonia, in the form of uræmic paralysis, develops under the influence of a toxic substance which, joined to the reflex action proceeding from the diseased lung, causes ischæmia of the nerve-centres, by acting on the vasomotor nerves. Aufrecht thinks that pneumonic hemiplegia in children is due to œdema of the brain and meninges.

PERICARDITIS IN CHILDHOOD.

KNOFF (*Rev. mens. des Mal. de l'Enf.* April, 1890). The author's report includes 10 cases of pericarditis in children. Of these 10 there were 3 under one year of age, 3 between one and two, and 4 between six and ten. Pericarditis in the newborn is usually due to a septicæmic process, which starts from the maternal organism, or else from the umbilicus of the child. Of the chronic diseases which predispose to pericarditis, tuberculosis is a good illustration, as are also all the inflammatory processes of the pleura, lungs, sternum, vertebral column, bronchial and mediastinal glands, thymus, and œsophagus. Pericarditis may also follow inflammation of the abdominal

organs and the peritoneum. In six of the author's cases the disease followed inflammation of the pleura and lungs, in one it followed chorea, in two scarlatina, and in one the cause was not ascertained. In very young patients there is often an absence of the ordinary physical signs which reveal the disease in the adult, including weakening of the heart-sounds and increase in the area of cardiac dulness. In fact the disease may develop without any appreciable symptom. Autopsies made by the author showed that the exudation was usually not abundant, and hence it could not influence the position of the heart, the area of dulness, or the relative position of contiguous organs. The exudation was also fluid in character, without fibrinous deposit, and hence the absence of friction murmurs. In older children the diagnosis is also a matter of difficulty, and when pericarditis is suspected an examination should be made every day, to observe the slightest modifications which may occur in the physical signs. The earlier in the case a diagnosis is made the more favorable will it be as to treatment. Among the unfavorable complications may be mentioned adhesion together of the two layers of the pericardium, for paralysis of the cardiac muscle will result with extensive dropsy. Symptoms of this form of cardiac paralysis are small and frequent pulse, subnormal temperature, œdema of the cheeks, lids, and lower extremities, and albumin in the urine.

DIABETES MELLITUS IN CHILDREN.

STEIN (*Arch. f. K.*, xi. 5 and 6). The recorded cases of this disease in children are not numerous. The author could find only 117, and 75 of these were published subsequent to 1876. An analysis of these cases showed the importance of heredity from an etiological standpoint, the parents being either diabetic or neuropathic. The influence of other diseases was seen in the fact that the diabetes was complicated by gastric catarrh, morbus maculosus Werlhofii, typhoid, malaria, measles, and furunculosis. The causative influence of a starchy diet, exposure to cold, and concussion of the brain, was noted in some of the cases. The initial symptoms varied; in fact, the beginning of the disease was seldom observed. In some instances there was emaciation, peevishness, enuresis, or intense hunger. Polyuria was the principal symptom, and the quantity of urine passed was sometimes enormous. The specific gravity varied from 1008 to 1042, and the quantity of sugar from five to ten per cent. Other symptoms which might be added were weakness, sweating, nosebleed, furuncles, abscesses, and cataract. As might be expected, the digestive organs gave marked evidence of the drain to which they were exposed. The patients exhaled a characteristic odor of vegetables, apples, or wine, and in some cases there were carious teeth, loss of appetite, vomiting, constipation, or diarrhœa. Death resulted in those cases in which the respiratory organs became affected. Nothing definite could be concluded from the pathological anatomy. The duration of the disease varied from two days to five years. In 6 cases the disease was fatal in a month, in 17 within a year, in 10 it continued more than a year, none of the cases being cured. Of 70 cases there was recovery in 14, improvement in 4, and death in 52. The regulation of the diet forms the most important feature of the treatment. Sour milk, to which glycerin and mannite were added, with three parts of

boiled water to one of milk, was given to nursing-infants with satisfactory results, the sugar disappearing permanently from the urine. The diet for older children was limited to soup, roast meat, raw eggs, cheese, and sour milk, sugar and starchy food being prohibited. Cod-liver oil and iron were also given with satisfaction. The alkaline carbonates were found serviceable, also large doses of mineral acids, which were given before breakfast and dinner. To the foregoing list of medicinal agents might be added the acetate and sulphate of iron, and salicylate of soda.

PURPURA.

VON DUSCH (*Rev. mens. des Mal. de l'Enf.*, May, 1890). The author is in accord with Hensch in regarding purpura as a distinct disease. He has seen about thirty cases in children, most of whom were two or three years of age, in bad hygienic surroundings, and badly nourished. Medical aid was summoned for most of the patients on account of profuse nosebleed, the nasal cavities requiring tamponning. The ecchymoses were well marked from the beginning, and were usually disseminated over the entire body with the exception of the face and hands. Purpuric spots were of frequent occurrence upon the bucco-pharyngeal mucous membrane. The disease lasted one to three weeks, and always resulted in cure.

Rheumatic purpura is a distinct form of the disease, and occurs in successive attacks, which are separated by remissions during which the patient may appear perfectly well. The spots in this variety appear upon the extremities, especially the lower ones. The duration of this variety is from a few weeks to as many months. There may be three subdivisions: First, that in which there are joint affections, some of the joints being painful or swollen; second, that in which there is concomitant intestinal disorder, in the form of colic, bloody vomiting, intestinal hemorrhage, but no articular symptoms; third, that in which there are both intestinal disorder and articular lesions. This variety of the disease may terminate fatally. In purpura hemorrhagica there is a change in the blood, in rheumatic purpura the symptoms are due to embolic processes.

THE TREATMENT OF INTUSSUSCEPTION.

BRINTON (*Arch. f. K.*, xi. 5 and 6). The author has collected from various sources 500 cases in which there was fatal intestinal obstruction, 215 of them being due to invagination of the intestines. The methods which are commonly used for the relief of this trouble consist in the introduction into the bowel of an elastic bougie, as far as may be necessary or suitable, the injection per rectum of a large quantity of hot water, or the injection of air. The latter method has frequently been tried in children, and has frequently been successful, especially if an anæsthetic has been used as an adjuvant. Operations of this character must neither be of too long duration, nor should they be attended with much violence. It may be necessary to repeat the operation several times, and the possibility of rupturing the intestines must ever be considered.

Barker has collected 63 cases in which laparotomy was performed on

account of intestinal obstruction, and in 34 of them relief was obtained. This operation must be performed early in order to be successful, though Carver has reported a successful case in which the diseased condition had lasted seven weeks at the time the operation was performed.

DIGESTIVE DISORDERS IN CHILDREN, AND THE DIAGNOSIS OF THE SAME.

MONCORVO (*Arch. f. K.*, xi. 5 and 6). The author concludes his paper in the following propositions:

1. Disorders of digestion in children are very common in Brazil.
2. The high temperature of tropical climates during the long summer tends to the frequent development of gastric disorders in children, and this may be more or less influenced by the excessive sweating which the heat insures.
3. Gastro-intestinal diseases often coexist with dilatation of the stomach in children more than two years of age.
4. In children under two years of age defective gastric digestion is usually caused by diminution or absence of free hydrochloric acid in the gastric juice.
5. In the subsequent years of life cases sometimes occur in which there is excess of acid in the stomach, but, as a rule, there is a deficiency, or a want of it, in dyspeptic children.
6. The remedy for deficiency in the supply of acid in the gastric juice consists in the proper use of hydrochloric acid.

PATHOLOGY AND TREATMENT OF TUMORS OF THE LYMPH-GLANDS OF A SCROFULO-TUBERCULOUS CHARACTER.

WOHLGEMUTH (*Arch. f. K.*, xi. 5 and 6). The author's paper concludes as follows:

1. Tubercular disease of the glands is very common during the first ten years of life.
2. The glands of the neck are involved in the majority of cases of this disease.
3. The susceptibility of boys and girls to this disease during this period seems to be about the same.
4. The prognosis of tubercular disease of the glands in young children is generally better than it is in adults.
5. If the tubercular disease of the glands is diffuse the prognosis is less favorable than if it is local.
6. Removal of tuberculous glands in children by operation is not dangerous, nor is there danger of local recurrence nor of general tuberculosis if the diseased tissues are thoroughly removed. Radical means should, therefore, be used fearlessly.

OLEUM RUSCI IN DIPHThERIA.

Tinctura rusci composita is recommended by SCHENDEL in diphtheria, given in half teaspoonful doses every hour during the day, and every two hours during the night. Children under two years received a smaller amount. Nothing else was used; no local application; diet was carefully regulated.

After three or four doses, the general symptoms disappeared; child roused itself from its apathy, and became lively; the gray exudation turned yellowish, some falling off and showing a granulating surface below. The tincture was tried in forty-three cases. Twenty-five were of the slighter form, and recovered after three or four days' illness; of the other eighteen, which were reckoned severe cases, two died, one underwent tracheotomy, and the remaining fifteen got well without complications.—*Berlin. klin. Wochensch.*, No. 6, 1890.

CHLORAL HYDRATE, ERGOT, AND NITRIC ACID IN THE TREATMENT OF WHOOPING-COUGH.

R. STEVENSON THOMSON, in the *Archives of Pediatrics*, June, 1890, p. 463, arrives at the following conclusion: None of these drugs is a *specific* for whooping-cough. Ergot is absolutely useless. Nitric acid is of no use as a specific, but its well-known tonic action makes it a useful drug when combined with the other means usually employed to improve the health of children suffering from whooping-cough. Chloral hydrate is of considerable service in so far as it mitigates the violence of the paroxysmal cough and diminishes the tendency to convulsions, but it has no influence on the number of paroxysms, nor does it shorten the attack.

ETIOLOGY OF INFANTILE SPINAL PARALYSIS.

CHARCOT (*Rev. mens. des Mal. de l'Enf.*, May, 1890). This disease belongs to the neuro-pathological family, and a neuropathic heredity is frequently traceable in those who suffered with it. The antecedents of the patients will usually reveal nervous affections, including hysteria, epilepsy, or resania. In opposition to this view is the recent statement of Cordier, of Lyons, that he had seen the disease in an epidemic form. In one of Charcot's clinical patients fatigue was an important causative factor, delirium supervening three days after the fatigue, and paralysis of one leg on the day following. There was no period of regression during which the paralysis existed in other parts and then appeared in the leg. For fifteen days after the first accident there was severe pain in the sciatic. Complete loss of all electrical reaction indicated the hopelessness of the case. A second patient was seized with chills without apparent cause, followed, the same evening, by paralysis of the right lower limb. The following night the left leg became paralyzed, and then the arm, though the paralysis in the latter was not pronounced. Retention of urine lasted several days.

ETIOLOGY AND TREATMENT OF INSOMNIA IN CHILDREN.

SIMON (*Rev. mens. des Mal. de l'Enf.*, May, 1890). The treatment of insomnia will depend upon the age of the child when it is due to digestive trouble. The condition may be the result of too frequent nursing, to improper physical condition of the mother, or to some peculiarity about her milk. With bottle-fed children the insomnia may be traced to the bottle or its contents. Should the insomnia continue after these precautions have been taken, a teaspoonful of lime-water or of Vals water may be given between consecutive nursings,

and as a laxative a teaspoonful of syrup of chicory, or a pinch of magnesia in sweetened water. If insomnia is due to premature weaning it will usually disappear if the child is restored to the breast. If weaning has occurred at the proper time the regulation of the diet will go far toward relieving any tendency to insomnia. When insomnia is dependent on indigestion in children two years of age and upward a dose of wine of rhubarb or of wine of pepsin at suitable intervals is indicated. To children five or six years of age give a few drops of the following mixture :

R.—Tinct. quinquinæ	.	.	.	.	.	.	5.00 grammes.
“ rhei	.	.	.	.	.	.	2.00 “
“ calumbæ	.	.	.	.	.	.	2.00 “
“ nucis vom.	.	.	.	.	.	.	0.50 gramme.

All food should be well cooked, and should be finely divided if there be any suspicion that it will not be well masticated.

Insomnia may be attributable to nervous disorders, which may be divided, in this connection, into several groups. The first group would include cerebral sclerosis, chronic hydrocephalus, cerebral tumors, bony lesions, with abscess of the brain. For insomnia from cerebral sclerosis, bromide of potash may be given until relief is obtained, either with or without the iodide. Should this be unavailing, valerian or chloral may be given, with calomel as a laxative. Similar treatment will be suitable with cerebral tumor, or chronic hydrocephalus, but not with cerebral abscess. The insomnia with the latter condition will continue until the pus is evacuated by suitable trepanation. The second group from which insomnia may result includes acute congestion, incipient meningitis, and cerebral irritation. With acute congestion, one should use mild revulsive agents, and, in addition, quinine, aconite, the bromides, and calomel. With incipient meningitis revulsives are also indicated behind the ear or at the nucha. With cerebral irritation, the bromides and chloral will prove beneficial, the latter being given by the rectum. For insomnia with headache, in growing children and those who droop under the confinement of school, a course of bitter tonics, gymnastics, lukewarm baths, and diminution of the hours of study, should be advised. With the neuralgias and chorea, the insomnia may be antagonized by suitable doses of antipyrine. If a child is hysterical, iron, valerian, asafoetida, and warm baths, should be used the same as if no insomnia existed. With epilepsy, if the bromides are ineffectual, strychnine and belladonna should be tried. With all the foregoing conditions galvanization of the head will prove most beneficial in adults, but from the anatomical peculiarities of the case, if it is used in children, the current must be very weak, and not employed more than half a minute at a time. Static electricity is not open to the same objection, and gives admirable results if the insomnia proceeds from chorea, hysteria, headache, gastro-intestinal disorder, or disturbed mental balance. When insomnia is due to pain, as in Pott's disease, coxalgia, white swelling, etc., large doses of quinine will sometimes afford relief. If due to the fevers, opiates must be given, but very gradually, for their depressant action must be remembered, and also the fact that they lock up the secretions. With influenza, quinine or antipyrine will relieve insomnia, and with the rheumatic diathesis the same drugs with the addition of salicylate of soda.

PUBLIC HEALTH.

UNDER THE CHARGE OF
EDWARD F. WILLOUGHBY, M.D.,
OF LONDON.

DENGUE IN EUROPE.

To one who believes in evolution as a law of the Universe, there is something very suggestive in the contemplation of diseases so closely resembling one another in their phenomena as to be distinguished with difficulty, yet essentially distinct, being never interchanged, and, if belonging to the non-recurring contagia, not mutually protective.

Such are variola and varicella, measles and R  theln, and such it would seem are influenza and dengue. The latter might almost be taken for a greatly intensified form of the former in its neurotic type, determined by conditions of climate, etc., had not the two diseases visited several countries last year in succession—dengue during the summer, and influenza during the winter following.

Dengue has been observed in every climate and at all seasons, though showing in temperate climates a preference for the summer months, as influenza does for the winter; and perhaps the comparative absence of pulmonary complications, to which, as we have seen the high mortality which attends the latter is most wholly due, is to be thus accounted for; what deaths do follow dengue depending rather on the disturbance of the nervous centres, and consequent on asthenia, hyperpyrexia, cerebral congestion, with convulsions or coma, irrepressible vomiting of a neurotic character, or rarely epistaxis.

In that class of diseases which Hirsch calls communicable miasms, but which we would rather term *extra-corporal contagia*, we have seen, during the present century, yellow fever slowly and cholera more rapidly tending to acquire an endemic character or permanent localization in fresh areas, and under climatic conditions less specialized than those of the countries to which they were previously limited. It would appear as if dengue must be included in the list of those which are gradually becoming naturalized between wider latitudes. It had visited Spain, and perhaps other parts of the Mediterranean shores, on a few occasions in the last century, but it had not established itself north of the 30th parallel of latitude until about forty-five years ago, although then, as in 1825, the epidemic, which originated in India had extended itself westward throughout tropical Africa, the West Indies, and the entire littoral of the Gulf of Mexico. In 1845, however, it took up its home in Egypt, spreading in the course of ten years over the whole of Northern Africa; thenceforth its progress was slow, creeping along the Syrian coast and confining itself to the seaport towns it had not gone further north than Alexandretta and the Island of Cyprus until last year. But in June, 1889, it appeared almost simultaneously at Beyrout, Jaffa, and other places, spreading with a rapidity equal to that previously seen only in Hindustan. By the end of August, at Beyrout 20,000 persons, in a summer population of 100,000, had been attacked; in Smyrna 150,000 out of 200,000.

and at Jaffa scarce anyone escaped. Constantinople was reached a few days after its appearance at Smyrna, and Salonika a week or so later. No longer limited to the seaboard, it extended over the whole of Asia Minor and the Lebanon, even at elevations of 4000 to 5000 feet above the sea, and involved all the islands of the Archipelago except Crete. Late in the summer it reached Athens, but this was its extreme westward limit, the Morea and the Adriatic escaping. Dr. de Brun, however, believes that having now, so to say, broken its former bounds, it will probably, whether after an interval of quiescence or not, ere long invade Italy and the south of Europe generally, adding one more to the list of epidemic diseases with which we are already familiar.

CHOLERA AT PETERHOF.

DR. DOBROSLAWIN contributes to the *Archiv f. Hyg.* an interesting report on cholera at Peterhof, illustrating in a striking manner the influence of a fall in the ground-water in determining the incidence of cholera. Not that Pettenkofer himself assigns to variations in the level of the ground-water the character of a *vera causa*, but he holds that these coöperate with the pollution of the soil in infecting the air of dwellings, etc.

Of the arrangements for the disposal of excreta Dr. Dobrowslawin unfortunately tells us nothing, but the important point in the history of Peterhof is the absence of wells which could be the sources of infection.

The town consists of a long line of houses running northeast and southwest on a terrace sixty feet above the sea; to the north is a cliff descending abruptly to a lower terrace scarcely above the sea-level, while to the south the land rises rapidly to a range of hills distant eight, ten, or twelve kilometres. The soil is gravel overlying a dense blue clay, the depth of the gravel being nowhere more than three feet, and often less. There are no wells, but the water-supply, abundant and pure, is brought from the Zaborod and Gliadin springs in the hills referred to, a further supply having been added since the time of Peter the Great, from Lapir sixty-four metres higher than the other springs; the distance of these being twenty kilometres and of Lapir twenty-two and one-half.

The combined supply is discharged into a series of pools, one below the other along the southern side of the town, and delivered under pressure to the houses and to the fountains and cascades on the lower terrace, which are the pride of the place. Though so near to, and in constant communication with St. Petersburg, it has, except in 1848 and 1854, enjoyed complete or almost complete immunity from cholera. In 1831 and 1832 it escaped entirely; in 1848 there were 167 cases, equal to 2.16 of the population, besides 58 cases occurring among the visitors. In 1854 there were 146 cases, of which 128 were visitors. In subsequent epidemics the numbers were, in St. Petersburg and Peterhof respectively, (1866) 18,655 and 3, (1870) 1785 and 0, (1871) 7158 and 1, (1872) 4871 and 1. Now the ground water, though close beneath the surface, maintains a constant level, and analyses prove that it is derived from the above-mentioned artificial pools or reservoirs, being very hard, while that of the nearest natural lake is unusually soft. But on the two occasions when only cholera gained a footing, the ground-water was lowered—in fact, was almost entirely drawn off; for in

1837 the conduit between Lapir and the Zaborod and Gliadin springs, which brings the larger proportion of the supply, became the property of a private landed owner, who for twenty years maintained a series of actions for the enforcement of his extortionate demands on the authorities of the town. Several times he threatened to cut off the supply, and actually did so in May, 1848 and 1854, necessitating the closure of the fountains, and of a carriage or sledge factory in which water-power was used. On the latter occasion, in the midst of the excitement, the tyrannical and litigious old gentleman died, to the great relief of the townspeople and the subsequent exemption of the place from cholera.

The immunity enjoyed by Lyons and some towns, the sanitary conditions of which are in no way better than those of others that have suffered severely, is connected by Pettenkofer with the constant level maintained by the ground-water; and whatever other factors may coexist, the experience of Peterhof cannot be explained as a mere coincidence.

P. S.—We would not be misunderstood; for movements of the ground-water and other local or meteorological conditions can only act as contributory causes, favoring the action of the essential causes either directly or indirectly, as by removing any inhibitory factors. It is well known that with pervious sewers transudation takes place inward or outward according as the relative pressure exerted on their walls by the ground-water or the sewage is the greater, and they thus either drain or pollute the subsoil. Movements of the ground-water play an important part in towns with pervious sewers, drains or cesspits, and wells, but if the former were absolutely impervious they would have little influence, and when the water-supply is laid on by pipes from distant reservoirs they cease to have any.

So at Peterhof, on each occasion of the approach of cholera, persons suffering from the disease, in a pronounced or an unrecognized form, there can be no doubt discharged their excreta into pervious cesspits, but so long as the water in the pools and in the sandy soil was high and moving from the former toward the sea, exosmosis from the cesspits and contamination of the reservoirs were prevented; but when the soil was dry and the level of the water in the pools had sunk below the line of junction of the surrounding gravel and clay, the fluid from the cesspits would find its way by percolation into the reservoirs.

Corrigendum.—The name of Dr. Frank should be substituted for that of Dr. Coleman in the July issue of the JOURNAL, page 10, fifth line from the bottom.

Note to Contributors.—All communications intended for insertion in the Original Department of this Journal are only received with the distinct understanding that they are contributed *exclusively* to this Journal for publication. Gentlemen favoring us with their communications are considered to be bound in honor to a strict observance of this understanding.

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THE
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SEPTEMBER, 1890.

A CASE OF BRAIN TUMOR (ANGIOMA CAVERNOSUM), CAUSING SPASTIC PARALYSIS AND ATTACKS OF TONIC SPASMS. OPERATION.

BY L. BREMER, M.D.,

AND

N. B. CARSON, M.D.,

of ST. LOUIS, MO.

THE following case is one that has been described as atypical myotonia, non-congenital, by Dr. A. B. Shaw, and as neuro-myotonia by Dr. Ch. Hughes, in the *Alienist and Neurologist*, January, 1890.

The patient was exhibited, and the disease discussed at length in the St. Louis Medical Society in the month of November, 1889. The opinions expressed on this occasion as to the nature of the trouble were widely divergent.

The patient was an inmate of the Poor-house, and was, for the purpose of more convenient and exhaustive study, removed to the St. Louis Polyclinic building, where I, with quite a number of medical gentlemen, saw and observed him for several weeks.

The following represents in substance my remarks at a meeting of the Medico-Chirurgical Society held February 18, 1890. The patient was present on that occasion.

Joseph McE. is about twenty-three years old, and was, up to three years ago, in good health. Inquiries as to heredity, syphilis, plumbism, etc., give a negative result.

The history of the case he relates in a uniform manner, and without any material contradictions, as follows: About three years ago, while

working in a mining mill, and feeling perfectly well, he was suddenly seized with a spasm in the left arm, which was drawn across the breast and upward, so that the clinched hand was resting on the clavicle. His arm was "locked" so that he could not remove a pipe which he was smoking at the time from his mouth. At the same time, he avers, there was a slow movement of the head from side to side. (In regard to any implication of the facial muscles his testimony is unreliable.) He felt "miserable all over" at the time, but at the end of a few minutes the spasm relaxed, and he continued to work as if nothing had happened. The same occurrence took place five hours later, while at breakfast. From this day on he had two spasms every day for about a year, when they increased in frequency.

For six weeks after the inception of the trouble he continued to work, being interrupted only when the spasms came on. At the end of this time the toes of his left foot "turned down" so that his walk became interfered with. There was now a weakness in the left foot; he began to limp; but, although the toes pointed downward, he was still able, as he claims, to walk on the soles of his feet. When the foot was first involved his speech became affected, he could not speak as fluently as formerly, and stuttered. At the same time jerks in various parts of the body supervened. They were so violent at times that on various occasions he came near being thrown from the chair. At the time the spastic flexion took place in the toes of his left foot his head was drawn to the left side, and became fixed in this position. He could not move it to the right for two months, and whenever he wanted to look at an object to the right, which was not within his visual field, he had to turn his whole body on its axis, like a person with wry-neck.

Even while in this condition he was still able to do odd jobs about the house—chop wood, for instance. But it would happen to him that, after having raised the axe preparatory to bringing it down on an object with force and quickness, he was prevented from doing so. His arms remained stiff and immovable, with the handle of the axe clutched with the hands in the raised position, for half a minute or so.

Subsequently, at a time which he cannot fix accurately, but at any rate several months after the involvement of the left foot, the right one became implicated, its toes likewise turning down. But the left leg and foot were then, and ever afterward, the weaker of the two. In fact, his whole left side was weakened, besides being spastic.

With all this his general health continued good, his appetite and all the functions of the body remaining in a normal condition, with the exception of his stomach. Although he digested well, he vomited every morning from the onset of the trouble for three months. In the last two and a half years these vomiting spells have lessened in frequency; they came on about twice a week, and were independent of the character of the food he ate; nor were they accompanied by other symptoms of intestinal disturbance.

Having become absolutely unfit for work he came to St. Louis to seek medical aid at the Mullanphy Hospital. Failing in this he went to Philadelphia, where he was under observation and treatment in the Philadelphia Hospital, under Dr. Charles K. Mills. It seems that he left that place suddenly, after a short stay, for the West, entered again the St. Louis Mullanphy Hospital, and finally landed at the Poor-house of this city. This was sometime in the summer of 1889. His case had

remained stationary, but in August, 1889, while at the Poor-house, the weather being extremely hot, he had an attack of great prostration, accompanied with persistent sleeplessness, nervousness, and increased spasms. These latter, whilst they were followed before by intermissions of about five minutes' duration when at their worst, now succeeded each other constantly, so that it was impossible for him to eat. Obstinate vomiting, and pains in the limbs brought about by the intense and uninterrupted contractions of the muscles, added greatly to his sufferings. After a week or so the attack passed off, and he was pretty much in the same condition he was in before, except that from this time on a new symptom developed, which consisted in periodical diarrhoea. His bowels became loose about once a week, and oftener whenever he underwent any unusual amount of bodily exertion.

The present state of the patient (three years after the inception of the disease) is as follows:

He is right-handed, five feet seven and a half inches in height, muscles well developed, general nutrition good. His speech is peculiar; there is no obvious flaw in phonation or articulation; no dropping of consonants, or syllables, or whole words; when he does speak he speaks perfectly, but hurriedly. But before he can begin a sentence it seems as if there were an obstacle to be overcome; this having been accomplished, he speaks rapidly, as if to make up for the time lost in overcoming the obstruction to utterance. There is never any hesitancy in pronouncing *yes, no, or well*. The latter he is fond of using as a starter, a preparatory exercise for limbering up the muscles engaged in articulating the more difficult letters and words. He repeats it with increasing rapidity a great many times (I have counted as many as twelve times), interposing the letter "a" after this fashion: well-a, well-a, well-a, well-a, etc. The great stumbling-block in beginning a sentence is S, or sh. The difficulty becomes sometimes insurmountable, so that he has to give up all attempts at conveying his thought. He then, in quite a natural tone of voice, will excuse himself, saying: "Well, I can't say what I want to say." In this connection he pronounces the two "S" that occur in this sentence without any difficulty.

But in regard to this difficulty, and for that matter all the other symptoms presently to be described, he has his bad and good days. On the latter his answers are prompt, without any halt or interruption. Thus it happened that, when I undertook to exhibit the peculiarity of the patient's speech to Dr. S. Weir Mitchell, during a recent visit to St. Louis, I utterly failed, the patient answering all the questions put to him in the most natural and fluent manner possible.

In general he is slow to answer questions, a fact which gives the impression of mental hebetude. Whether there is any real impairment of the mental faculties is very hard to determine, since there is no relative or acquaintance who could compare his present mental state with the one before his ailment set in. A noteworthy feature in his mental condition is that he never begins a conversation; he lacks initiative; and it seems that an impetus from without is necessary to rouse him sufficiently to engage in conversation. He claims that this was always the case with him, that, as long as he can remember, he has been "a person of few words." On the whole it may be stated that, in spite of his grave affec-

tion, which for the last three years has so disabled him, that he has had to seek refuge in the Poor-house, he is not to any great extent depressed; there is, on the contrary, an element of optimism observable in his mental make-up. Though his answers to questions put to him are tardy, they are always to the point, and no flaw in his reasoning powers can be discovered. How much of his taciturnity is attributable to the disturbance of speech, and how much of a suspicion as to his mental condition is due to the weird appearance which his face and body present in consequence of often-repeated slow tonic contractions in the face, neck, and limbs, is hard to determine. Among his fellow-patients he passes as absolutely level-headed.

There seems to be, however, little doubt that he is very irritable. He claims that this has been the case only since the onset of the present trouble.

In engaging him in conversation, one is struck above all by the constant tendency of the head to turn to the left; presently his left arm moves, and he hooks with the index and third fingers flexed in the second and third phalangeal joints any available object within his reach in order to steady the arm. Meanwhile he fixes his eyes on the interlocutor, while his head turns slowly away from him. All this impresses the observer as extremely odd, and one is apt to misjudge his mental calibre.

He is unable to whistle, but claims that he never was a good whistler. He moves his tongue slowly from side to side, and dares not protrude it for fear that his jaws might close with a snap—an event which on a previous occasion caused him to bite his tongue severely. He grinds his teeth occasionally, but qualifies this as a bad habit. He masticates slowly, swallows ordinarily with ease, but at times he has to wait a number of seconds before the bolus can be pushed beyond the pharynx. The eyes are moved slowly from side to side, somewhat more rapidly, it seems, up and down. There is a great variation in the size of the pupils. On some days they are inordinately dilated and in a subparalytic state, reacting only little and sluggishly to light and accommodation; on others they seem of normal size and reaction.

Acuity of vision and extent of the visual field are normal. So far as the patient's peculiar affection, to be described later on, will allow it, he reads the papers without difficulty. The only trouble, as he avers, is that when he glances hurriedly at the headlines the letters are apt to run together.

Occasionally twitches in the facial muscles on the left side are observed. The skin covering the left side of the neck is markedly wrinkled.

The symptoms now to be detailed are of a twofold nature: 1st, paralytic; 2d, spastic.

The whole left side is weak; the grip in the left hand, as ascertained by the dynamometer, is only one-half that of the right, on his bad days only one-third. The head, if unsupported, is apt to drop forward after holding it erect for some time. The left arm cannot be raised beyond the horizontal when abducted; he raises it easier, but not quite to a perpendicular line, when adducted. The left leg is considerably weaker than the right one.

Accompanying this hemiparesis there are contractures in the left upper and lower extremities. As in ordinary contractures (late rigidity) in hemiplegia due to hæmorrhage in the internal capsule, the flexors in the arm and extensors in the leg are chiefly affected. The position of the

hand is characteristic. The fingers are clinched, the hand flexed at the wrist and pronated.

These contractures of hand and fingers are not permanent, however. Though with difficulty, the patient succeeds by a great effort of the will in extending the hand and opening the fingers. The latter process is a very singular one. The thumb, index, and third fingers are the first to obey the mandate of the will; after they have been extended a little while the fourth and fifth fingers follow slowly. The closing takes place in the inverse order: first, the fifth and fourth are flexed, then the others gradually close upon the palm of the hand. All these movements are executed reluctantly, as it were, on the part of the muscles.

He cannot keep the hand open except by the aid of the other hand or by pressing the palm against some flat object. There is also a tendency of the arm to be flexed at the elbow. This can be, however, easily overcome by the will.

The left leg is permanently extended at the ankle, and unless prevented from being so, by bracing the foot against some object, it stiffens at the knee. The foot is slightly inverted, the sole arched, the toes in the position of flexion characteristic of permanent contracture in late rigidity of common cerebral hemiplegia. The big toe presents the typical *hallux flexus* (hammer toe), the second, third, and fourth are flexed and abducted; the little toe turned inward under the fourth. A complete reduction of these contractures is impossible; being spastic in origin they have become organic by permanent shortening of the muscles of the calf. (Even in the chloroform narcosis during a subsequent operation they could not be reduced.) There is, then, talipes equino-varus of the usual type in spastic cerebral hemiplegia.

The right foot is nearly of the same appearance as the left, but instead of extreme flexion there is hyper-extension of the big toe and the varus complication is absent.

Both legs do not only stiffen and extend in the knees (unless prevented from doing so by mechanical means), but they also tend to flex in this stiffened state on the abdomen. Hence, the patient cannot lie on the back without the legs being in the air. Owing to this spastic stiffness in the knees he cannot cross the left leg over the right knee without the aid of the hands. The leg will stand out straight from, and at a right angle with, the body, until he grasps the foot by the heels and by pulling it toward the body, flexes the leg. The same may be said, though to a less degree, of the right leg. This he can cross over the left knee, but for some time the leg will remain in extension until it succumbs to the law of gravity and drops down, not suddenly, however, or at an even rate of quickness, but with intervals of arrest, after the cog-wheel fashion.

The spine is arched, the left shoulder, when standing erect, a little lower than the right; both conditions, however, can be almost completely corrected by an effort of the will. Though slowly and laboriously, the patient generally succeeds in straightening himself out.

The abdominal muscles on either side are stiff and retracted, the left pectoralis hard and unyielding. In fact, almost the whole muscular apparatus of the body is in a state of rigidity of varying intensity. The right arm is the least affected of the extremities; the right side of the face seems to be entirely free.

Every voluntary movement is at once opposed by the simultaneous contractions of the antagonists. The effort to overcome the latter causes

the odd appearance suggestive of the movements of an automatic wax figure. Owing to the constant counter-action of the antagonists he is unable, for instance, to shake his head, or with the good (right) hand to hammer a nail.

He experiences, however, occasional involuntary jerks in various parts of the body. These have been so violent at times that he has been in danger of being thrown from his chair.

During sleep, and especially when lying curled up in bed, the rigidity passes off, to reappear immediately on awakening and moving. Passive flexion and extension call immediately the antagonists into action.

FIG. 1.



The anthropoid walk.

His gait is of striking singularity. On several of his good days, perhaps three or four times within the last year, he has been able to go about for a short time without a stick. Ordinarily, however, he has to make use of this in order to move from place to place. In doing so he uses the right leg in spastic equinus position as a fulcrum, which he reinforces by the stick. This he grasps with the right hand, the right arm being extended in such a manner that the thumb is in front and the four fingers back of the stick. The palm of the left hand usually rests on the upper end of the stick. (See Fig. 1.) He now swings the left leg, which is in spastic extension, around and forward in a semicircle, with a kind of slide, scraping the floor; then, with a quick movement, he shifts the fulcrum (right foot and stick) forward, etc. All this while the head is turned to the left, the spine arched, the abdominal muscles retracted,

the platysma wrinkled, the tendinous insertions of the sterno-cleido-mastoid muscle prominent. The extremely clumsy and uncouth appearance, and the long stick which he uses for the purpose of locomotion, suggest at once the *anthropoid* walk.

In the ward he prefers to shift himself about, utilizing the hook-like flexion of the index and third fingers of the left hand as a means of securing a hold on the iron bars of the bedsteads, using, of course, the right hand also. Of late, however, when necessity compels him to move about, he prefers to crawl on all-fours—to the water-closet, for instance.

In walking with the stick it takes him some time before he gets well started. The first few shuffling movements (one cannot call them steps) being made, the movements become somewhat easier, but he soon tires and becomes exhausted.

During the erect posture his feet are separated about one foot and a half, the weight of his body resting exclusively on the balls of the feet and the flexed toes.

He cannot walk with the feet naked on account of the pain occasioned by the pressure of the body on the tips of the toes.

Sensibility: There is no sensory disturbance of any kind; the patient recognizes, the eyes being closed, the slightest touch with the bedclothes, a sheet of paper, or the gentle blowing on any part of the body.

Reflexes: The superficial reflexes are all present. There is no difference between the right and left abdominal reflexes.

The knee-jerk would be, to say the least, brisk, if it were not for the antagonists preventing the excursion of the leg on tapping the tendon. That there is an increase can be demonstrated by the indirect tapping. The index finger being placed with the palmar aspect on the patellar tendon, the slightest tap on the dorsum which, under normal conditions would not produce a reaction, is followed by a distinct contraction of the quadriceps muscle. This method of demonstrating the exaggerated knee-jerk in spastic states of the muscle in which the excursion of the leg is prevented by the contraction of the antagonists, was demonstrated to me by Dr. S. Weir Mitchell on the occasion referred to above. The electrical reaction, both muscular and neuro-muscular, is normal. The mechanical irritability of the muscles, especially when in a spastic condition, is increased at times.

Spasms: In addition to the permanent and transitory contractures, he has distinct attacks of spasms of a peculiar kind. These vary in frequency and intensity just as his other symptoms do. There are days when he has one every five minutes; there are others when he has only ten or twelve. They are brought on by exertion and emotions, but they also occur spontaneously. He can bring them on himself by contracting certain muscles, but has also the power of controlling them to a limited extent. It is especially those that he brings on himself (for purposes of demonstration), but only to a small extent the spontaneous ones, that he can in a measure stop in their progress.

Beginning, progress, and nature of the spasms: They are initiated by a slight tremor of the head. They commence invariably in the muscles of the neck, and more specifically in the platysma myoides, as evinced by the deep creases seen in the skin covering it. The head turns slowly to the left, the eyes are closed, the left angle of the mouth retracted and depressed, the frontal muscle corrugated, the eyebrow arched.

At the same time, or a short time afterward, the arm, with the hand

clinched and flexed, is extended and carried forward, then flexed and adducted so that the wrist and forearm grate the abdomen and lower ribs. Generally, however, he does not allow this movement to go through its entire course, but grasps the seat of the chair on which he sits in order to steady the arm.

Occasionally another movement takes the place of the one just described. The clinched fist is supinated, the forearm flexed on the upper arm. In this position the upper arm is raised by the muscles of the shoulder, and the forearm brought up to a level with the occiput, so that the fist rests on the latter. At this juncture the patient generally carries the arm over the head, and it gradually goes down by his side in a semi-flexed position.

After the spastic movements of the arm, which, as stated above, occur often simultaneously with those in the neck and face, the left leg is extended at the knee, the talipes becomes more pronounced; it is flexed on the abdomen; after this the right leg is attacked, and the same muscle-groups as in the left enter into the state of contraction. The spasm never reaches the right arm, but a slight tremor is experienced in it and the right leg, winding up the series of the spasm.

Meanwhile the arching of the spine ordinarily present has become more pronounced, the trunk is rotated, the muscles of respiration are also involved. Breathing becomes for a short time impeded. The head is now retracted, and no more deflected to the left. The patient opens his eyes and the spasm abates in those muscles first in which it commenced, *i. e.*, in the muscles of the neck on the left side. Sometimes at this juncture the head slowly rotates to the right. Ordinarily, however, this rotation is voluntary, and resorted to for the purpose of relieving the muscles of the neck concerned in the spasm. Then, one by one, the other muscle-groups limber up to a certain extent, never entirely so. The order of the spasms is always the same. They never take place in the inverse direction, from the right foot to the left, for instance. They never extend beyond the right leg. These spasms are, as stated above, in a measure under the control of the will. They can be modified and lessened in their intensity. They can also be brought on voluntarily by the patient contracting the left platysma myoides, and inclining and turning his head to the left. Often they are aborted, the contractions remaining confined to the muscles of the left side of the head and left arm. The original locked spasm during which the left arm is drawn across the chest does not occur any more.

Consciousness has never been lost, or even dimmed. A frequent repetition of the spasms has a weakening but not absolutely paralyzing effect on the muscles involved.

Résumé: A brief recapitulation of the history, symptomatology, and the present state of the patient presents these features:

At first (three years ago) there is a spasm localized in the muscles of the left arm and neck. This, in the early stage of the disease, occurs periodically, twice a day. Later on, more frequently, and at irregular intervals. Six weeks later a contracture in the left foot sets in, and hemiparesis becomes manifest, together with contractures. Gradually the right leg becomes plastic. The spasms now attack in a serial order, or at least nearly so, various groups of muscles, starting invariably in

the neck. All the symptoms, spasms, contractures and weakness, get progressively worse.

Clinical diagnosis: Cerebral paralysis (hemiparesis) with contractures, complicated with tonic intermittent spasms.

SEAT AND MORBID NATURE OF THE AFFECTION.—There can be no doubt as to the topical diagnosis. There is a well-known clinical picture which is vividly recalled by our case—that is, congenital cerebral spastic paralysis. The paresis, with contractures and the accompaniment of every emotion and physical exertion by spasmodic movements, stamps it at once as one akin to this form of paralysis. There are, indeed, some cases of infantile spastic hemiplegia which, barring the mental defect ordinarily accompanying it, present the identical motor disturbances of our case.

Unlike the ordinary cerebral hemiplegia with late rigidity in adults due to hemorrhage, our case commenced with spasms limited to the muscles of the head and arm on the left side. There was then, probably, an irritating lesion of some kind pressing either on the centres presiding over those movements, or their conducting fibres. This lesion, being a discharging one at first, must by slow growth have developed into a destroying one, causing paresis on the opposite side. Since the sensibility is everywhere intact, it stands to reason that this lesion (undoubtedly a coarse one) is high up in the motor tract, where there is an absolute separation of the motor and sensory tracts and centres. We have to look, therefore, as the probable seat of the lesion, not to the internal capsule, the common seat of coarse lesions, notably hemorrhage producing hemiplegia, but to a higher level, the corona radiata, or the cortex itself.

The steady but slow progress of the disease, the appearance of spastic symptoms first, and of the paralytic later on, suggests at once the existence of cerebral tumor of slow growth in or beneath the Rolandic region.

Again, the serial order of the tonic contractions justifies one in thinking of Jacksonian epilepsy, which, as is well known, is caused in the majority of instances by a coarse irritating lesion in the psycho-motor area. It is true, there are never any clonic spasms, no general convulsions, nor ever any loss of consciousness; yet, there is a distant resemblance to an epileptic attack of the Jacksonian type in the periodical spasms of our patient. As an old-time, sun-bleached daguerrotype still reveals the essential traits of the picture to one familiar with the person it represents, so there are here the indisputable elements of Jacksonian epilepsy.

Even idiopathic or genuine epilepsy, so called, presents in many instances, features which we find in our case. The rotation of the head, the retraction and depression of the angle of the mouth, the simultaneous

locking of the arm, such as is produced by faradizing Erb's point, the closing of the eyes, the initiatory and concluding tremor, and finally, the impediment of respiration, are more or less suggestive of an epileptiform nature of the spasm. It is true, the tonic character of the latter throughout, and the absence of the clonic variety, stamp our case as quite an exceptional one. Still, reasoning by exclusion, and considering the fact that the spasms start always in the same group of muscles, a tumor in or near the centre presiding over those movements suggests itself.

There are two possibilities as to the seat of the supposed tumor. The history of the case, as given by the patient himself, would point to a region in the cortex in or near the centre for the movements of the arm and the rotation of the head. But a close observation of the patient during the spasms, and when free from them, shows that the contractions of the platysma and the flexion of the hand always initiate the spasm, and that in the aborted ones these movements alone take place. Hence, with great probability, we have to look to these centres or their immediate neighborhood as the seat of the lesion. These centres (platysma and wrist) are, as is well known, in close juxtaposition.

From here, as in the physiological experiment, the irritation travels upward, involving the centres for the movements of the shoulder, head, leg, and foot on the same side, leg and foot on the opposite side. Arriving at these centres the irritative force is exhausted, it seems. If it were to go beyond to the arm-centre, and to the centre opposite the one it started from, namely, that of the platysma, there would be, probably, general convulsions and loss of consciousness. These never occurred, as remarked before. But even the arm-centre for the right arm must be in an irritated condition, since there is an inhibition to all intended quick movements, the antagonists entering into activity immediately. There is also a tremor in it at the end of the spasm, denoting in all probability the ultimate radiations to this member of the discharge of accumulated nerve energy.

ABSENCE OF SYMPTOMS ORDINARILY ACCOMPANYING BRAIN TUMOR.—However, though the serial order of phenomena and the *signal* symptom (in the sense of Seguin), as manifested in the simultaneous contraction of the platysma myoides and the flexion of the wrist, point to the existence of a tumor in or near the respective cortical centre on the opposite side, one of the most important cardinal features of brain tumor is absent—headache. The patient has at no time suffered from it, except during a brief period of his career as a workman in a mining mill, where everybody was subject to this trouble. He never complains of it now. According to Mills and Lloyd, in only five of cerebral tumors has headache been missing.

He has never had vertigo, and as to the mental hebetude which generally accompanies brain tumor no trace can be discovered. He is a

close observer and a good judge of his surroundings and of his own condition.

Yet, a mental peculiarity to which Wernicke¹ has called attention is present. He lacks initiative in conversation; he never commences one; but when addressed on a subject enters into it with intelligence and interest. It is also difficult to engage him in a conversation about a topic not connected with his case.

Again, the very pronounced form of contractures in this case of hemiparesis is suggestive of tumor, and the implication of the leg on the other side corresponds with the observations of Hughlings Jackson² on this point, who, as early as 1874, pointed out this fact as a peculiarity of hemiplegia caused by tumors. He designated it as the third degree of hemiplegia.

The contractures in our case are of the usual type, whether produced by hæmorrhage or tumor—*i. e.*, the flexors predominate in the arm, the extensors in the leg.

The question as to cortical or subcortical is hard to solve. Burdon Sanderson claims to have demonstrated that stimulation of different points in a horizontal section, through the deeper parts of the hemispheres, produces the same effects as stimulation of the so-called centres. This observation taken together with the hemiplegia with contractures, which points to a destruction of conducting fibres, makes a subcortical seat probable.

Whether the contractures in a case of hemiplegia are always due to a descending degeneration, as Charcot maintains, seems to be as yet a mooted question. Besides, degenerative changes in the motor tract, irritative changes in the dura, and slight but continued irritations of the cortex may give rise to them.

All these considerations leave the cortical or subcortical seat undecided.

As to the histological nature of the supposed tumor only surmises are admissible. Glioma, fibroma, lipoma, a cyst, perhaps a cysticercus, may be thought of. With great probability it is not malignant.

But, as has been time and again stated by all competent observers, a diagnosis of brain tumor is hazardous, and remains doubtful until the existence of choked disk is demonstrated. The patient's sharpness and range of vision speak against such a complication. But after the tumor had been diagnosed and localized from other symptoms, an ophthalmoscopic examination, made by Dr. H. L. Wolfner, of this city, has revealed a beginning choked disk, which clinches the diagnosis.

The foregoing remarks, as stated above, were made at a meeting of

¹ *Gehirnkrankheiten*, iii. p. 303.

² *British Medical Journal*, July 25. 1874.

the Medico-Chirurgical Society of this city. The diagnosis of partial choked disk was confirmed by Drs. Alt and Barek, and a consultation as to the advisability of an "exploratory craniotomy" was held with a number of prominent members of the St. Louis medical profession. No material objection was raised against the operation.

The question of operative interference was rendered especially difficult to solve by the fact that no case of this nature is on record. The literature does not show an instance, as far as I know, in which the symptom-grouping as described had led to an *intra-vitam* diagnosis of tumor; much less is an operation recorded. But taking all things into consideration, above all the progressive character of the lesion, and the declaration of the patient that he would prefer death to a life-under such circumstances, the operation was deemed justifiable. It was not, as a matter of course, expected that a complete recovery was in the range of possibility. The tumor, or whatever other coarse lesion would be found, had necessarily destroyed brain substance enough in the motor area to set up some degree of descending degeneration. This could not be done away with, but its spread might be arrested by operation, and the very annoying spasms which made his existence almost insupportable might be eliminated, leaving the case as one of cerebral spastic paralysis, with a prospect of less impeded locomotion and prolongation of life.

EXPERIMENTS.—Experimentally the following results were obtained: The bromides, in doses of 90 to 100 grains, did not arrest the spasms, but made him feel more comfortable, provided physical exertions and emotional disturbances, such, for instance, as were connected with medical examinations, were avoided. Strychnine, $\frac{1}{16}$ of a grain daily, increased the number and intensity of the spasms, and made him feel weaker and generally miserable. Although there never was a decided paralysis after a spasm, a considerable degree of weakness could be demonstrated, principally in the left arm, on his bad days. The head also would, under such conditions, be more apt to drop. Unfortunately, no attempts at measuring the temperature over the supposed seat of the tumor were made. This omission is the more deplorable, as probably, in the light of later developments, positive data of diagnostic value might have been obtained.

Such positive results, however, were obtained with electricity. I will state at the outset that, like disturbances of any other kind, electricity, no matter how or where applied, would aggravate all the symptoms, and, if persevered in for any length of time, would insure a sleepless night. But discounting these general effects, certain modes of application to certain places could be demonstrated to be followed invariably by the same phenomena. Thus, whenever a faradic current strong enough to elicit muscular contractions from the motor points was applied

to the left platysma myoides a typical spasm would result. The application of the same strength to the right platysma was without result.¹

FIG. 2.



In a state of hemilateral spasm induced by faradic stimulation of the platysma myoides.

Again, wetting the scalp on the right side of the head, and applying a five-square-centimetre electrode, with a galvanic current of 3 to 4 milliamperes interrupted 60 to 90 times a minute, to the area where, at a rough guess, the centres for the platysma, movements of wrist and fingers, and rotation of the head are situated, the same spasms of the same sequence were produced. The positive or negative pole was used, apparently with the same effect. The indifferent electrode was placed either to the left of the sternum or on the left side of the left scapula, in order to avoid the electrical excitation of such muscles as could of themselves be thrown into a tonic contraction by the stimulus, notably the left platysma and the muscles of the left arm. Counter experiments were made in sufficient numbers, and with the necessary precautions to exclude any possible sources of error, and the fact was established that faradic irritation of the left platysma myoides and a galvanic current interrupted from 60 to 100 times in a minute, applied over the cortical centres from which the spasms were thought to be originated, invariably gave rise to the same serial order of phenomena. Thus the faradic peripheral irritation of the "signal" muscle, and the transmission of the

¹ The spasm during which the photograph of the patient was taken was thus experimentally produced.

interrupted galvanic current through the motor "starting" centres, were capable of producing the identical spasms.

One fact may be expressly mentioned here, viz.: that a strong faradic current applied over the centres, the other electrode being on the opposite side of the skull, or at any other indifferent place—*i. e.*, not particularly liable to spastic contractions—did not yield any results.

Thus matters stood when, an exploratory trepanation having been determined upon, the head was shaved for craniometric purposes. To my great satisfaction an old scar was discovered about two and a half inches above, and a little back of the external auditory canal. The patient himself had been unaware of the existence of such a scar, and from its appearance the injury producing it must have dated back many years, possibly to infancy. This scar, about one-third of an inch in length, was about parallel to the sagittal line of the skull, not painful, and seemingly movable. This was an additional sign corroborative of a cortical lesion of the right motor area of the brain.

The electrical tests, most of them made in the presence of Drs. Herman and Wolfner, of this city, were now much more striking. It was demonstrated that the interrupted galvanic current applied just to, or in the immediate neighborhood of the scar, was, with unvarying regularity, followed by an attack of spasms. From the nature of the case these experiments, though sufficiently numerous to prove beyond a doubt the experimental facts as just described could not be continued long, or repeated often, since experience had taught me that one spasm predisposed the patient to another one, and he dreaded and disliked such experiments.

Another fact worthy of note was also evolved experimentally. The patient, as remarked at another place, had never during the course of his ailment complained of any trace of headache. The first application of the interrupted galvanic current (before his head was shaved) produced a pain at the seat of the application which extended to the forehead, and lasted half a day. During the subsequent electrical tests the same region was always more susceptible to the painful effects of electricity than any other.

With the foregoing data on hand the patient was prepared for an operation.

REPORT OF OPERATION. BY DR. CARSON.

Joseph McE. was received into the St. Louis Mullanphy Hospital March, 1890. His general condition was good, and with the exception of the cerebral trouble his health was perfect. Immediately after his entrance into the hospital preparations for the operation were commenced. They consisted in warm baths at night, regulating the secretions, and shaving and washing the head.

March 26. The patient was brought to the operating table. One hour before he had had administered, *per os*, two drachms of fluid extract of

ergot, and one-half hour before one-fourth of a grain of sulphate of morphine, subcutaneously. In the presence of a number of physicians and surgeons of this city, an Esmarch band having been applied around the head, and under the most strict antiseptic precautions, the operation was commenced. The site of the scar, shown in the accompanying cut¹ (Fig. 3), was marked on the bone by a small drill hole. The surface

FIG. 3.



Showing the fissure of Sylvius and the fissura Rolandi, drawn with the aid of Wilson's cyrtometer. The dark spot at the angle formed by the convergence of the fissure of Sylvius and fissura Rolandi represents the site of a small cicatrix which has been enlarged about four or five times by applying lamp soot. The line anterior and parallel to the fissura Rolandi represents the prefrontal sulcus.

of the cranium was then exposed by a rectangular flap, including the pericranium, three inches broad by four inches in length, with its base forward. The pin of an inch and a half trephine was then applied at the site marked by the bone-drill, and a corresponding button removed.

This was a task of some difficulty, on account of the temporal ridge being included in the circle of the trephine. Upon the removal of the disk of bone the dura mater bulged boldly into the opening. This was slightly opaque, and all normal pulsation, both on inspection and palpation, was absent. The trephine opening was then enlarged by the rongeur forceps until it was about two inches square. As the dura was removed the brain pushed rapidly through the incision and protruded nearly an inch beyond the outer surface of the cranium. The vessels of the pia covering this protruding mass were enlarged, turgid, and tortuous, while the cortex underneath presented a reddish-brown appearance, and was readily compressible, and would rapidly refill after having been compressed.

The tumor could be outlined on three sides, above, below, and behind, while in front it seemed continuous with healthy brain substance. An exploring needle was introduced to the depth of an inch and a half,

¹ The size of this scar is much exaggerated in the picture, it being in the original very small and indistinct.

when it seemed to meet with more resisting tissue. Its withdrawal was followed by a flow of serum, and afterward by pure blood; this in turn was followed by a partial collapse of the tumor, but it was only of momentary duration, as it soon became tense as before.

Wishing to increase the size of my opening somewhat I again used the rongeur, and in so doing, unfortunately, my forceps slipped and lacerated the surface of the presenting tumor. According to the statement of one of my colleagues, this was followed by an escape of a considerable quantity of reddish-brown fluid, which I did not see. Free bleeding followed from the lacerated surface, which could only be controlled by compression. This surface was of a dark reddish-brown color. The finger introduced into this laceration entered to the depth of about a half inch or more, and took a direction forward about an inch, when it entered a cavity the size of a small hickory-nut, with smooth walls, and which seemed to be surrounded with healthy brain substance. Then, with the handle of an old spoon, sharpened by long use, I proceeded to remove the protruding mass, which was exceedingly friable, breaking down rapidly, and coming away with the utmost facility. This procedure was continued until apparently healthy tissue of normal consistency was reached. Macroscopically the mass removed presented a mottled, dark-brown, yellowish, and partly gelatinous appearance. Some of the pieces seemed to consist of brain substance traversed by dense punctiform hæmorrhage, whereas others were made up of a dark-red shreddy material (no doubt stroma of the cavernous angioma, subsequently diagnosed by the microscope). This included, for the most part, the cortex, but extended also into the subcortical region. The part removed was about the size of a large walnut, and made quite a cavity, which was rapidly filled by healthy brain matter. After the removal of all the diseased tissue the surface was cleaned, and a rubber drainage tube introduced to the bottom of the cavity. The dura mater was then replaced, and sutured with a continuous catgut suture. The trephine button and bone clippings, which had been preserved in warm bichloride cloths, were then replaced, the button being attached to the flap with catgut sutures. Three horse-hair drains were put in position under the flap, which was closed with a continued catgut suture. A slight bichloride gauze dressing was applied over all, and the patient returned to bed.

The operation lasted two hours, and when completed the condition of the patient was not good. During the operation much blood was lost, not from any one or more distinct points, but from a general oozing from the entire surface of the wound in the brain. This bleeding was not controlled in the least, either by the application of hot water at 120° Fahr., or by the application of a ten per cent. solution of cocaine. The patient was returned to bed, the feet elevated, and a subcutaneous injection of digitalis and brandy given, and warmth applied. The operation was completed at about 1 o'clock in the afternoon, and at 5 o'clock the patient had partially reacted. By 10 o'clock P. M. reaction was complete.

It will not be necessary to go into a detailed account of the progress of the case. Suffice it to say that the convalescence was uninterrupted, the highest temperature reached being 99.6°. The rubber drain was removed at the end of forty-eight hours, and the horse-hair drains at the end of the third day.

The improvement in the patient's symptoms has been most decided.

the spasms having entirely disappeared since the operation. Three days after the removal of the tumor the evidences of paralysis, noted by Dr. Bremer, were exaggerated, but no new groups of muscles were involved. There was complete loss of power of the muscles of the back of the neck, and the power of raising the left arm to the head was lost, as was also the ability to extend the left hand, which had completely lost its grip. Anæsthesia was complete in the arm and over the platysma, partial in the left side of the face. This condition was unchanged two weeks afterward. At present, five weeks after his admission into the hospital, the patient sits up in bed, moves himself freely without assistance, and has regained to some extent the use of all the muscles paralyzed by the operation.

There has been no return of the spasms. The only evidence of his previous condition remaining is a slight spasticity in the legs, more marked in the right than in the left. He is now able to lie in bed upon his back, extended to his full length, a condition impossible before the operation. There is a loss of muscular sensibility in the left hand, most pronounced in the fourth and fifth fingers, which are, moreover, almost completely anæsthetic, only a sharp pinch or a deep prick with the needle being perceived. General sensation, to wit, sense of pain, pressure, and temperature, is also impaired in the three remaining fingers, least of all in the thumb, in which, however, as in the rest of the fingers, the muscular sense is entirely absent. In an effort at locating the seat of the pain produced by the prick of a pin, he makes frequent mistakes, least so when the thumb is the object of experiment. In addition to the fourth and fifth fingers the ulnar side of the hand and three-fourths of the arm are paralyzed.¹ At first there was a slowness in answering questions; apparently he had to collect his words before he could reply, but after his sentence was made up there was no hesitation in utterance. This has all disappeared, and he now replies to questions promptly and without delay.

The scalp wound completely healed in less than a week, and at present shows little evidence of the injury inflicted, the replaced bones having apparently united, as the surface of the cranium is smooth and solid, and it is with much difficulty that the site of the operation can be made out.

The fissure of Rolando was located by two different methods. First, by Thanes's method, and then with a Wilson's cyrtometer. The fissure of Sylvius was located by the usual method. The scar was found to lie at the lower end of the ascending parietal convolution, as indicated by the accompanying diagram, corresponding to the platysma-centre in Ferrier's scheme. The intention had originally been to trephine midway between the platysma and the head-centre—*i. e.*, in a line from the lower end of the ascending parietal obliquely forward and upward. The finding of the small scar changed the plan.

So far as I was able to determine, the cavity in which I introduced my finger involved a part of the ascending frontal convolution, extending somewhat into the base of the second frontal convolution.

¹ There is now, in the seventh week after the operation, a slow return of tactility and muscular sensibility.

The following conclusions were drawn from the results of the operation: First, that the Esmarch bandage completely controlled the hæmorrhage from the scalp wound. Second, that the administration of ergot (*per os*) and morphine subcutaneously must have had a very decided influence upon the hæmorrhage from the brain surface; although this was considerable, it was nothing to what we should have expected, considering the nature of the tumor, had not some influence been exerted upon the vessels by the drugs. Third, that the application of ligatures to the vessels in the brain substance is not such a difficult task as we are led to believe from reports; the forceps held well, and with care the ligatures were applied without difficulty. Fourth, that the cocaine solution, ten per cent., and hot water at 120° Fahr., applied to the bleeding surface, exerted no influence whatever in checking the hæmorrhage; pressure was the only means that seemed to control it in the least. Fifth, the impressions conveyed to the finger by the tumor are worthy of note. The whole tumor could be entirely compressed, and felt much softer than the surrounding brain substance. While there was not the slightest approach to fluctuation, yet the feeling was that of a fluid displaced by the pressure; upon removing the pressure the tumor rapidly refilled, and presented through the cranial opening.

The masses removed by the operation consisted partly of shreds of reddish-brown appearance, partly of fragments of brain substance of variable appearance. While most of it bore a mottled aspect, caused by brown spots of varying size and separated by the intervening brain substance at different intervals, other pieces looked more homogeneous and gelatinous-like.

The whole mass, as removed, was collected in Müller's fluid, and a microscopical examination showed that the coarse lesion producing the peculiar symptoms in Joseph McE.'s case was an *angioma cavernosum*.

CONCLUDING REMARKS BY DR. BREMER.

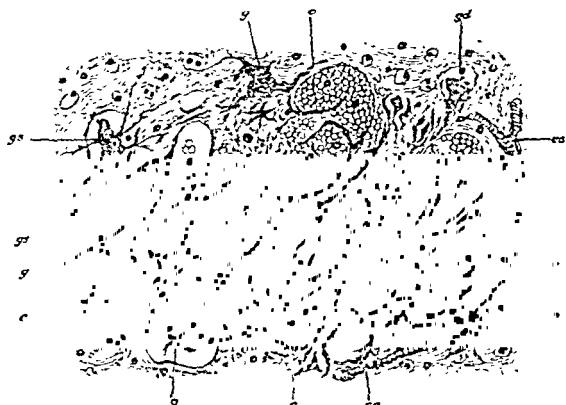
MICROSCOPICAL EXAMINATION.—Many sections of the brownish mottled-looking particles of brain, representing cortical and a small amount of subcortical layer, were made vertically and some horizontally to the brain surface. Without staining, and examined simply in water or glycerin, the sections exhibit round and irregular brown spots of varying size, some with fluted outlines, interspersed in seemingly normal brain substance, both in the cortex and in the subcortical regions. Some sections look perforated because the brownish masses, which are made up of blood, have fallen out; these sections have a meshy, or, as it were, a worm-eaten appearance. In other specimens a fan-like arrangement of the brownish masses, radiating from the depth to the periphery, can be seen. (Elongated caverns run parallel to the radiating nerve-fibres and vessels in the subcortex.)

Of the various staining substances tried, an aqueous solution of gentian-violet gives the best and most characteristic pictures, a bluish mass (the brain substance), dotted with round and irregular yellow spots (the blood in the caverns). Whereas in the depths of the tissue, pointing toward the radiating crown, loose, irregular meshes of a longitudinal arrangement (parallel to the course of the cortical and subcortical blood-vessels) can be demonstrated, filled with blood, the character of the morbid mass changes higher up in the cortex, wherever this is involved—and in the vast majority of sections examined it is. There, in the cortex—and for that matter, in the subcortical conducting substances, whenever moderately involved in the pathological process—the genesis of the latter can be seen. The blood circulating in the main mass of the spongy tumor in the deeper parts of the brain, in its endeavor to expand to the higher and neighboring districts, utilizes the preformed lymph spaces surrounding the cortical and subcortical arterioles, establishing an ever-expanding extra-arterial current. The same obtains in the lymph-spaces of some capillaries. Owing to the peripheral pressure thus produced by the extra current of blood the vessels are in some places compressed, in others atrophied and reduced to a thin, irregular thread; in still others completely obliterated. In the more advanced stages of the pathological process the surrounding brain substance forming the interspace of the respective vessels atrophies, and the remnant now appears as partitioning walls of the caverns filled with blood. Thus a sponge-like arrangement results in those places where pressure and consecutive atrophy of the brain substance have been most pronounced. There is no cell-lining to the caverns. In some instances the cortex has entirely disappeared and the blood caverns extend to the surface, separated from the pia mater only by an exceedingly thin strip of an amorphous substance.

The giant pyramidal cells in the neighborhood of the caverns have, through pressure, changed their forms to the spindle shape; others have conformed to the new order of things, and their lymph spaces having been invaded by the blood-stream, they have become part and parcel of the meshwork or stroma, as it were. Under these circumstances they have adapted their shape to the new requirements, their processes describe arcs and seem to interlace with the processes of the neighboring ganglionic cells (after the fashion of the branches of two neighbor trees). Some of the ganglionic cells are characteristic for the comparatively intense tint which they have assumed, denoting that the micro-chemical reaction to the staining material is more active in them than in the rest of the cells of the same kind. Is this deep stain due to a chemical change in the protoplasm caused by functional hyperactivity? And is the latter caused by the overgreat amount of the nourishing fluid in which they are, so to say, constantly bathed? These seem to me legiti-

mate questions to ask, but they cannot at present be definitely solved. In looking at some of the ganglionic cells in Fig. 4, one is struck by their resemblance to the spider-cells found in the various chronic inflammatory cortical affections. This would seem to lend support to Kleb's view, who regards the spider-cells as degenerated ganglionic ones.

FIG. 4.



g. Ganglionic cells of varying shapes; some have adapted themselves, by pressure, to the contours of the blood caverns, practically forming part of their walls or stroma. *gd.* A degenerated ganglion cell. *gs.* Ganglionic cells approaching the spider-cell type. *c.* Caverns filled with blood. *ca.* Capillaries.

The masses removed and examined come, no doubt, from the lower end of the ascending parietal convolution. In this, we know, the giant pyramidal cells are to be found only in the immediate neighborhood of the central fissure, whereas the hind portions of the convolution are devoid of such cells. From my specimens I conclude that only a small

FIG. 5.



a. Layer of compressed and necrosed brain substance. *b.* Tumor mass showing the stroma.

part of the cortex near the central fissure is represented in the removed mass, the main bulk coming from the posterior part of the ascending parietal. This conclusion is based on the absence of the giant-pyramidal cells in the vast majority of the tissue-pieces examined.

In some portions the cortical, and to a varying extent, the deeper

masses have lost their structural peculiarities; the pyramidal cells and (subcortically) the medullated nerve-fibres have disappeared and a finely granular and reticulated tissue, dotted to a varying degree with round cells, has taken their place. It is atrophied brain substance. There is also evidence of inflammatory activity in some parts, there being round-celled infiltration, especially around necrosed islands of brain tissue.

Angiomata of the brain are not very rare tumors. Mills and Lloyd¹ mention their occurrence, but do not speak of angiomata cavernosa. As a rule, cerebral angiomata are congenital; there is no new formation of vessels, but simply a telangiectasis. In this case there was possibly at first such a congenital angioma, which under strain ruptured, the blood suddenly inundating the neighboring peri-arterial lymph spaces. The sudden increase in the growth was great enough to produce a discharge of nerve energy in the shape of a locked spasm, but it was not large enough to act as a destroying lesion. This took place later on when the patient began to limp. Since he grew gradually but constantly worse, it stands to reason that the tumor was constantly growing. The final result would probably have been rupture of the whole mass and death of the patient by apoplexy. Was the injury which produced the scar concerned in the production of the angioma, or was it only an incident that this insignificant remnant of a very old trauma happened to be found in the region where the tumor had been located? And with which arterial system did the meshwork communicate? The radiating and fan-like arrangement alluded to above, points to branches of the lenticulo-striate artery.

GENERAL CONSIDERATIONS.—The one clinically recognized form of disease which our case resembles more than any other is infantile spastic hemiplegia. In this, as in our patient, the spastic symptoms often overshadow the paralytic ones. These spastic phenomena, the irritative contractures, as well as the involuntary movements accompanying, or even preceding, not only bodily movements, but also emotion and speech, we meet with in this case. But, instead of being post-hemiplegic motor disturbances, as they ordinarily are, they occurred before any decided hemiplegia set in—*i. e.*, they were *pre-hemiplegic*. There were first mono spasms, afterward hemiplegia.

The articulatory disturbances are not exactly such as one finds in the infantile forms of spastic hemiplegia; but there is in some cases of this disease a peculiarly explosive form of speech, accompanied by spastic movements of a tonic nature, in the face and various parts of the body, which reminded me very much of the patient's articulatory defect.

One word about the serial order and the frequency of the spasms. Hughlings Jackson, the ingenious observer of the kind of epilepsy which

¹ Tumors of the Brain, etc. Pepper's System of Medicine, p. 1049.

bears his name, takes it to be an explosive discharge of the ganglionic cells which are overloaded with nutritive material, and attributes it to the irritation and hyperæmia existing in the neighborhood. It is probably owing to this extreme degree of blood-supply, caused by the angiomatous character of the superficial substance of the cortex, that the frequent discharges took place, as evidenced by the tetanoid contractions and the serial spasms. It is, perhaps, rather hazardous, but I cannot forbear to suggest a possible causal relation between the peculiar forms and chemical behavior toward the staining agent on the one hand, and the spasms on the other.

The frequency of these discharges explains further the almost exclusive occurrence of tonic—i. e., milder—spasms, the clonic ones requiring, as it were, a larger amount of stored-up energy. The contractures which, it had been hoped, were due, before the operation, to irritation of the dura mater, or the cortex, owe probably their origin to a descending degeneration. Such, at least, is the inference from the existence of the considerable defect of subcortical nerve substance.

The final developments in this case tend to verify Seguin's view as to the distinguishing symptoms between strictly cortical and subcortical tumors: "In favor of subcortical location of tumor (speak) local or hemiparesis, followed by spasm; predominance of tonic spasm, absence, small degree or very late appearance of local headache and of tenderness to percussion." (*Med. Record*, Feb. 13, 1886.)

The facts stated elsewhere that the left fingers, and partly the hand and the ulnar side of the arm, are anæsthetic, and that the fingers have lost their muscular sensibility, and that the platysma region was for weeks completely without sensation, whereas the face felt only numb, are, perhaps, calculated to throw some rays of light on the vexed question as to whether, and to what extent, the motor centres subserve, beside motion, tactility and muscular sensibility.

It will be remembered that before the operation there was not the slightest evidence of any sensory disturbance noticeable about the patient. The simultaneous abolition of sensation in the platysma region, and in the fingers and part of the hand and arm after (at any rate partial) ablation of their motor centres, would, to say the least, go to prove that the sensory cortical areas for regions which are outwardly so far apart as the platysma and fingers, and whose motor centres are so close together in the cortex, must be situated in close proximity. The paresis (before the operation) without any involvement of sensation, speaks in favor of differentiation in the cortex; the paralysis with anæsthesia after operation (removal of a comparatively small area) points to a more or less common cortical seat of motor and sensory functions. If these sensory areas (including tactile and muscular sensibility, and sense of pain and temperature) are at all separate from the motor centres, they must be immediately

behind their respective motor areas. Now, it seems pretty certain that the function of voluntary motion resides only in those parts of the cortex in which the giant pyramidal cells are met with; again, the larger part of the diseased brain mass, subjected to a microscopical examination, does not contain them, and is consequently derived from the posterior portion of the lower part of the ascending frontal convolution, possibly in part from the anterior margin of the parietal lobe, and the loss of sensibility might be explained on this ground.¹

Taking everything into consideration, I am inclined to favor Starr's view, who asserts "That perceptions occur in the gray matter of the cortex of the central region and parietal convolutions, and that the various sensory areas for the various parts of the body lie about, and coincide to some extent with the various motor areas for similar parts, but the sensory area is more extensive than the motor area, extending into the parietal behind the motor area, which is confined to the ascending frontal and parietal convolutions."

The patient cannot tell when his fingers are passively flexed or extended. He feels a sharp pinch, or the prick of a pin, but he cannot locate it. Therefore, muscular sensibility and the faculty of locating cutaneous impressions (tactility) must have common centres that lie close together. It is probable that a considerable portion of the centres for the fingers was removed, the trephine hole having been made, in my opinion, rather above the platysma centre; and yet the grip is now pretty good. Is it owing to substitution centres that motor power is returning, or are we permitted to think of a *lower* centre as presiding over these coarse motions? The fact that he cannot move a finger alone, but has to flex or extend them all, might, perhaps, speak in favor of such a supposition. The thumb-centre seems to have suffered least, since he can move it in every direction, and since tactility is demonstrable to some extent.

The statement will be remembered that the ring and little fingers were weaker than the index and middle ones. The operation intensified this weakness, and in the same degree corresponding to the extent and severity of the paralysis, impairment of sensation took place. *Pari passu* with motion, sensation returns. The index and middle fingers were, after operation, as they had been before, his best, both as to motor power and sensation.

Recent experiments of Ferrier, Horsley, and Schäfer, place tactility in the limbic lobe. The facts in our case cannot well be reconciled with such a view, unless we assume that, in introducing his finger into the

¹ The possibility must be admitted, however, that cortical substance not possessing the structure characteristic of the motor areas may, after all, be endowed with motor functions, especially in fields for such weak muscles as the platysma, perhaps respiratory and abdominal muscles, etc.

cavity, the surgeon injured the sensory conducting fibres going to that locality, but it would be hard to understand how only those for the fingers and the platysma could have been injured.

The exacerbation of all the symptoms on physical exertion and emotion is easily explained in this way: The tumor amounted practically to a blood-cyst, which communicated with the arterial system. Any increase in the activity of the heart (exertion and emotion) necessarily increased the supply of blood to the cyst, increasing the pressure and stimulating the ganglionic cells.

A later history of this case will be published in due time.

RESPIRATORY PARALYSIS AFTER DIPHTHERIA AS A CAUSE OF PULMONARY COMPLICATIONS, WITH SUGGESTIONS AS TO TREATMENT.

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A PERUSAL of some of the literature of diphtheritic paralysis leads me to think that too little attention has been paid to the effects of paralysis of the muscles of respiration on the movements of the chest and to the affections of the thoracic viscera which may result therefrom.

That the muscles of ordinary respiration are liable to this form of paralysis is presumably accepted by every one; yet I have been surprised to find how comparatively few observers have recognized this complication, even in hospital practice, where it should be relatively frequent. Moreover, the condition is not absolutely rare, seeing that in the course of the last four years at least fifteen cases of it have come under my personal observation.

Recent writers on diphtheria, whilst discussing at length the varieties of cardiac paralysis, say little or nothing about the effect of diaphragmatic or intercostal paralysis on the lungs, and through them on the pulmonary circulation and the heart.

This paper is the outcome of observations made on fifteen cases of diphtheritic paralysis in which the muscles of ordinary respiration, especially the diaphragm, became more or less involved. Thirty-four consecutive cases of the disease, treated in the wards of the North-eastern Children's Hospital, furnish thirteen of these. One case, which occurred in 1886, first drew my attention to the subject; the others occurred more recently. They are distributed as follows: One case in 1886, five in 1888, and nine in 1889. I have met with only one doubtful case during the present year, although several patients with diphtheritic paralysis have been under treatment in the hospital.

These figures obviously afford no index of the relative, much less of the absolute, frequency of the complication; but they undoubtedly show that it is not altogether rare.

It is generally met with in "bad" cases—that is, in those in which the paralysis is widely distributed and profound; and this circumstance probably accounts for its being sometimes overlooked, as it is not usually deemed expedient to submit such cases to very searching examination, and the signs of paralysis of the diaphragm and of other respiratory muscles are often but slight deviations from the healthy movements, such as might easily be missed in the presence of more striking or urgent paralysis.

The classical signs of diaphragmatic paralysis are: reversal of the respiratory movements of the epigastrium and hypochondria; dyspnoea on exertion or excitement; diminished force of cough, sneezing, spitting, etc.; and loss of compressive action of the abdominal muscles, difficulty in defecation, etc. (von Ziemssen). The more constant and obtrusive physical signs presented by the cases now under consideration were:

1. Increased movement of the lower ribs, observed in ten out of fourteen cases; not noted in three.
2. Altered movements at the epigastrium during respiration in twelve out of fourteen cases.
3. Altered character of cough and voice. Noted in ten cases, but probably present in all.

These signs are well illustrated by the following cases:

CASE I.—Henry H., æt. four years, admitted to the Northeastern Children's Hospital on August 18, 1888.

History: Has never been robust. In the middle of July he suffered from a painful and severe affection of the throat, with enlargement of tonsils and discharge of blood-stained mucus from the mouth. There has been some ulceration of the mouth until a week ago. On August 17th a nasal twang was first noticed, and there was regurgitation of food through the nose. On August 20th he was taken into the garden, but fell over in attempting to pick up something, and complained of his right leg, which was powerless. The right arm became weak on August 22d, and the left leg on the 28th. The parents stated that the house-drains had been out of order for some time, and that two cases of diphtheria had occurred four months before in a neighboring house.

State on admission: Markedly anæmic. Occipital glands enlarged. Great general weakness. Temperature 98.6° F. Pulse 120, irregular and intermittent. Heart in normal position; intermittent action; no murmurs. Respiration normal (*sic*), 16 per minute. Tongue covered with a patchy white fur. Liver and spleen not enlarged. Some scybala felt in hypogastric and left iliac regions. There is general muscular weakness. The soft palate is motionless. The pupils are equal and active.

The superficial reflexes are all present, but the knee-jerks are absent. Some urine, which had to be drawn off by catheter, was normal.

August 30. Heart very irregular and tumultuous last night. (Ordered ext. convallariae, gr. $\frac{1}{2}$ every two hours, and brandy at the rate of 3 ounces in the twenty-four hours.) The following note was dictated at my visit that afternoon: "There is marked pallor of the integuments and a somewhat earthy tint. Breathing is deep, rather slow, and entirely thoracic. The epigastrium falls in during the deepest inspiration, and no downward movement of the abdominal viscera can be detected. The depression at the epigastrium fills up again during expiration. Diaphragmatic paralysis is apparently complete. All the intercostal muscles seem to act strongly. The heart's action is regular and rapid, with sharp sounds." Is taking liquid food and brandy in sufficient quantity. (Ordered a hypodermic injection of brandy and ether every three hours.)

31st. Very restless last night. Breathing labored, *alæ nasi* acting. Lips and ears dusky. Pulse very small; too rapid to count. Urine contains much albumin and some pale urates. "The epigastric sinking is not quite so obvious to-day, but the abdominal wall is occasionally seen to bulge distinctly during expiration. The expansion of the lower ribs is also rather less than yesterday, and there is a very slight sinking in of the lower intercostal spaces during inspiration. Air enters well into the upper part of the lungs, but very imperfectly along the anterior margins and at the extreme bases. There are no râles. The temperature remains down. Pulse 204."

September 3. Patient is looking rather better, although the temperature has been somewhat raised during the last three days. Pulse 138, full, of good tension, and regular. Breathing still costal, with inspiratory recession of epigastrium. Respiration 36. Air enters well (*sic*). The loss of power in the arms has increased since admission; the child cannot now raise his hands to his head. The grasp is very weak on both sides. The plantar and epigastric reflexes cannot be obtained. The voice is still nasal and indistinct, and the child appears unable to cough. There is constipation since four days. (To have stimulant hypodermics every six hours.)

4th. Evening temperature yesterday 100.6°, this morning 99.6°. Yesterday, at 4 P. M., the patient suddenly turned very pale, and the breathing became more rapid (42) and labored, with irregular pulse (144). At the same time the inspiratory recession at the epigastrium became more marked. He was given a stimulant hypodermic, and the daily allowance of brandy was increased to four ounces. Breathing is quieter this morning, but there is still some cardiac irregularity. Tongue is dry and furred.

6th. Evening temperature yesterday 101°. Heart's action still irregular and excited; pulse-beats do not correspond to the contractions of the heart. Epigastric recession about the same. Toward evening the temperature rose to 103°, and signs of consolidation, with moist râles, were detected at the right base. The child was now very restless, breathing about 60 per minute, with a pulse of about 170. There was gradually increasing asphyxia during the next few hours, against which free stimulation and artificial respiration availed nothing, and death closed the scene on September 6th.

Necropsy: On opening the chest the heart is uncovered by lung. The diaphragm rises to the level of the third interspace. There are no pleural adhesions. *Right lung:* The whole of the lower lobe is of a

dark-blue color, and entirely devoid of air. The lobules are well seen on the surface. The cut section shows numerous slightly raised patches of broncho-pneumonia, of a lighter color, grouped around the smaller bronchi. The lung tissue is soft and unduly wet. The posterior part of the right upper lobe shows recent pneumonia, contains but little air, and presents a granular section. The rest of the lung is œdematous and crepitant. The *left* lung presents exactly similar changes throughout the lower lobe, though in a somewhat less degree. The upper lobe is œdematous. The heart is firm, but pale, the pericardium healthy. The abdominal viscera appear healthy to the naked eye.

CASE II.—Willie W., æt four years. Admitted October 24, 1889. Five weeks ago he had a bad sore-throat, and was brought to the hospital a week ago because he could not walk.

State on admission: A fair, well-nourished boy; rather fretful. Is unable to stand without support. No ocular paralysis. Voice natural. No trouble in swallowing. Movements of palate rather sluggish. Movements in respiration normal; no evidence of failure of diaphragm. Heart and lungs healthy. Knee-jerks absent; superficial reflexes present.

October 29. There was some difficulty in swallowing liquids yesterday for the first time, and to-day the patient coughs and splutters with each attempt. Palate is quite motionless.

November 2. Some improvement in swallowing. Pulse 96, of good quality. Temperature subnormal.

6th. There is a faint internal squint in the right eye, and the lateral movements of the eyeballs are limited. Voice distinctly nasal since two or three days. The child very rarely speaks. Is still able to swallow slowly and with much care. The movements of the lower ribs are somewhat excessive, and the abdomen only moves slightly during respiration. The epigastrium, however, still bulges occasionally during inspiration.

8th. To-day there is a slight but undoubted bulging of the epigastrium during expiration. There is no dusiness of face or lips. Cough is rather troublesome, especially after swallowing, but still retains its explosive character.

9th. The abnormal movements are rather more accentuated to-day, and the cough is decidedly less forcible. Pulse 88, of fair strength, but rather irregular. A few rhonchi are heard over the lungs. Air enters freely into every part. Was ordered to be fed by nasal tube, and to have artificial respiration performed for ten minutes three times a day.

11th. No obvious change in patient's condition. The expiratory bulging of the abdomen is a little more marked, and there is distinct recession of the abdominal wall during inspiration.

12th. General condition rather improved. The movements of the lower ribs are very obvious, and distinctly excessive, when compared with those of a child in an adjacent cot. Expansion is more obvious than elevation.

14th. Last night the child became restless and paler, and the breathing slower. This morning he is quieter, and the lips have regained a better color. He can now scarcely move his head from side to side. Yesterday the arms became weak, and their movements incoördinate. Breathing is still entirely thoracic. Respirations 24 per minute, long and

sighing. No physical signs at the bases. Pulse 124, full, but very compressible. (Artificial respiration for ten minutes every six hours.)

15th. At 11 A. M. the child suddenly vomited, the face became dusky, respiration came in gasps, and the pulse became extremely weak and running. A hypodermic of ether was immediately given, and artificial respiration performed. The color improved a little, but the patient did not properly rally. He vomited again at 2 P. M. Faint bronchial breathing was now made out over the bases, but soon became obscured by copious moist râles. At 4 P. M. he was slightly livid, and sweating profusely. There was gasping respiration, with very excessive movement of the lower ribs. During inspiration the epigastrium was sucked in under the ribs, and flapped outward during expiration. There was also slight inspiratory recession of the lower interspaces. Death occurred at 4.15 P. M. The temperature never exceeded 99°.

A post-mortem was not allowed.

CASE III.—William B., æt. four and a half years. Admitted September 11, 1888.

History: Had diphtheria six weeks ago. Three weeks after the onset there was regurgitation of fluids through the nose, and during the last four days he has been weak on his legs.

State on admission: Pale, well-nourished. There is general muscular weakness, with tottering, uncertain gait. Both hand grasps are feeble. The voice is nasal. The soft palate does not move during phonation, and flaps backward and forward during respiration. There is no ocular paralysis. The knee-jerks are absent, the superficial reflexes present. The heart's action is regular, the pulse good. The respiratory movements are those of health.

September 14. Voice more nasal and weaker. Pulse 120, slightly irregular. Temperature normal. Breathing 18, sighing in character. Swallowing is effected with more difficulty, and occasions attacks of coughing. The movements of the lower ribs appear to be increased in both directions. The inspiratory filling in of the epigastrium is not so marked as on admission, and the descent of the diaphragm feels less forcible. (To have artificial respiration for fifteen minutes once each day.)

17th. There is slight percussion dulness over both pulmonary bases, with weak breath-sounds and occasional large moist râles. Beyond this the patient's condition is not appreciably changed. Pulse 120, of fair tension, and a trifle irregular at intervals.

24th. The movements of the lower ribs are much increased. No downward movement of viscera during inspiration can be made out at the epigastrium. The diaphragm appears to be deeply involved. Cough is more troublesome, especially after drinking. At the right base there is deficient resonance, with very weak breath-sounds and bronchial expiration. Vocal resonance is not appreciably modified. On deep breathing a few moist râles are audible. Air enters the left base freely. Pulse 114, of good quality. Temperature varies between 98° and 99.2°. (Artificial respiration to be performed twice a day for fifteen minutes.)

25th. The epigastrium does not move during respiration. The abdominal note is obtained as high as the sixth rib in the right nipple line, the lung note being recognized as low as the fourth rib. Air enters very imperfectly into this lung; breath sounds very feeble at right scapular

angle. The cough has quite lost its explosive character. (To be placed on his left side, and to have artificial respiration three times a day.)

28th. Condition much the same. There is profound anemia, but, on the whole, the general aspect of the child is somewhat better. To-day the breathing is essentially upper costal. The epigastrium is still motionless. The cough is a little stronger, but still lacks suddenness. Air enters the right base decidedly better, but there is still some evidence of collapse. The temperature remains down. The general muscular weakness is much the same.

29th. Patient speaks better to-day, especially in articulating the explosive consonants. The palate moves distinctly in phonation.

October 1. There is slight (normal) movement of the epigastrium to-day. The right base continues to clear up.

2d. Liver dulness from fifth to seventh spaces in nipple line. Swallows without coughing since yesterday.

5th. Respiratory movements of lower part of chest are gaining in amplitude, but the breathing is still mainly upper costal. Pulse 90, of good quality. There is marked general improvement.

7th. Liver dulness reaches to margin of ribs in the nipple line; edge felt during deep inspiration. Paralysis of limbs is passing off perceptibly.

16th. Is putting on weight rapidly. Diaphragm now acts normally. Artificial respiration omitted two or three days ago.

24th. Sits up in bed, but is still unable to stand. Knee-jerks still absent.

November 1. Discharged convalescent.

CASE IV.—Percy S., æt. two years. Admitted August 12, 1889.

History: Had diphtheria five weeks ago. Recovered in a fortnight; remained weak. Ten days ago he lost the power of walking, and during the last eight days his voice has become altered in quality.

State on admission: Fair color, well nourished. No obvious ocular paralysis. Cry distinctly nasal. Palate and uvula quite motionless. Often coughs after drinking. No regurgitation of liquids through nose. Can move his legs about, but is unable to stand. Knee-jerks absent. Superficial reflexes feeble. Urine free from albumin. Rhonchi and scattered moist râles over lungs. Heart acting normally. Temperature 98.6°.

August 14. Cough troublesome. Is fed entirely by nasal tube.

16th. Last night, after a severe attack of coughing, the child began to breathe hurriedly and the surface became rather dusky. On examination the diaphragm was contracting, but the movements of the lower ribs in front appeared excessive. The temperature had risen to 101.2°. The distress passed off after a subcutaneous injection of brandy. Temperature this morning 102.8°. At 7 A. M. the child was sick after being fed, and rapidly became cold and blue. The diaphragm was now found to be inactive. Artificial respiration for fifteen minutes caused a marked improvement in the child's condition, and half an hour later all signs of distress had subsided; but the abdominal wall remained entirely passive excepting a trifling fulness of the epigastrium during expiration. The movement of the lower ribs was much increased. Evening temperature 102.6°. Chest not examined.

19th. Child doing well. Pulse 132. Temperature has fallen to normal. Artificial respiration has been systematically performed every six

hours since the 16th with good results. The chest moves well. The abdomen is still motionless. There are no signs of pulmonary collapse or of broncho-pneumonia. Feeding is still entirely by the nasal tube.

20th. Yesterday afternoon the diaphragm began to act slightly. (Artificial respiration omitted.) He still coughs and splutters on attempting to swallow liquids.

24th. The movements of the abdomen are now fairly good, but still less than they should be. There is a marked general improvement. The cough has a more natural ring about it, and the voice is clearer.

29th. Improvement continues. Cough quite natural. No signs of diaphragmatic weakness remain, and the action of the lower ribs is normal.

September 7. Child now sits up in bed, but cannot yet stand. Discharged convalescent on the 11th.

CASE V.—Alfred E., æt. two years and four months. Admitted September 18, 1889.

History: About seven weeks ago he had a yellow discharge from the nose, and at about the same time the voice acquired a nasal character and fluids regurgitated through the nose after drinking. There is no history of sore-throat.

State on admission: The child is in a very prostrate condition, and makes no attempt to move in bed. The face is pale and a trifle dusky. There is a slight horizontal nystagmus, but no ocular paralysis. There is a very slight right facial paralysis. The chest moves well in respiration, and the movements of the lower ribs are not obviously increased. The abdominal walls are blown outward during expiration, and the diaphragm appears to be quite passive. There is an occasional non-explosive cough. The knee-jerks are wanting, and the abdominal reflexes are also in abeyance. There are moist râles all over the lungs, with a tendency to bronchial breathing at the left apex; no percussion dulness. Respiration 24. Pulse 128. Temperature 101.2°.

September 23. There has been no decided change in the child's condition. The temperature has been slightly above normal on one or two occasions only. The râles are more numerous over the right side of the chest. This morning the breathing became more embarrassed, and the movements of the lower ribs distinctly exaggerated. During the day the child grew more restless as the signs of asphyxia gradually increased. Artificial respiration was of no avail. Death occurred on September 24th.

Necropsy: There are no pleural adhesions on either side. The posterior portion of the right lung is extensively collapsed, the lower lobe being affected almost in its entirety. Portions of the collapsed lung sink in water. The left lung is in a precisely similar condition. The cardiac valves are healthy. There is slight distention of the right auricle. The liver and kidneys are congested.

Want of space prevents a more detailed narrative of these cases, but I may add that the whole series conformed very closely to one type. Paralysis of the palate and pharynx was present in every case, and tube-feeding was frequently rendered necessary by the difficulty of swallowing and the leakage of food into the air-passages. Obvious paralysis of the lower limbs was the rule, and in some the arms also became

affected. The knee-jerks were absent in every case. In a few the muscles of the back and neck were unmistakably involved, but in others how far the weakness observed was due to actual paralysis or was simply the expression of extreme general debility was not made out.

The children were all markedly anæmic, and a dusky or earthy tint was observable in some of the more severe cases. They lay for the most part quite still in their cots, without exhibiting any signs of pain or distress. The way in which they spared their breath was very striking. In the worst cases it was impossible to get a word from them, though they would generally express assent or dissent by a nod of the head. The breathing was usually slow, sometimes sighing in character, but not labored; but after cough or other exertion signs of dyspnœa often became apparent. A short, non-explosive, ineffectual cough was also a common feature in these patients. Wherever secondary changes occurred in the lungs, such as extensive collapse or broncho-pneumonia, or when sudden cardiac failure supervened, the symptoms of these conditions naturally modified to a considerable extent the general aspect of the case. It should be added that none of the patients had been tracheotomized.

Increased movement of the lower ribs has been one of the earliest as well as one of the physical signs most constantly associated with diaphragmatic failure. It varies within wide limits, both in amplitude and duration, becoming more obtrusive when the respiratory efforts are violent, and diminishing to a considerable extent during quiet breathing. As a rule, this overaction has been most obvious where other signs of diaphragmatic paralysis were well marked, and has invariably disappeared when the diaphragm resumed work. Its character may be modified to some extent by the presence and degree of paralysis of the abdominal and intercostal muscles, but, apart from this, it is simply an exaggeration of the healthy movements. The resulting expansion of the lower portion of the thoracic cage is all the more striking, that during the same period the epigastrium is either passive or actually receding, a state of things the exact reverse of what obtains in the dyspnœa of broncho-pneumonia and collapse, to which these cases sometimes present a superficial resemblance. The phenomenon appears to be due to a compensating over-action of the scaleni and intercostals, which is intensified by the diminution or removal of the steadying action of the diaphragm on the lower ribs. It is of especial value, because by its early appearance it gives timely warning of approaching danger.

The nature of the altered abdominal movements is so clearly illustrated by the cases quoted above, that it does not call for any lengthy notice in this place. A diminution in the extent of normal movement should always arouse suspicion, and, in my opinion, cessation of movement, short of reversal, is already an indication of paresis of the diaphragm. Valuable information may also be obtained by laying the

hand lightly on the epigastrium, any marked diminution or cessation of inspiratory filling-out of this region being readily appreciable in this way, particularly if the manœuvre is repeated in routine fashion at each visit.

The cough is always modified to some extent, at first becoming simply weaker, but eventually losing altogether its explosive quality (in severe cases), so that the patient is quite unable to expel any secretion or foreign body from the bronchi. Concurrently the voice becomes progressively feebler and aphonic. Strictly speaking, it is incorrect to attribute feebleness of expiration and of the associated reflex acts, cough, spitting, and sneezing, to paralysis of the diaphragm, since in all these it is relaxed. It affects them only by causing the preceding inspiration to be incomplete. But, over and above this, it is highly probable that weakness of the muscles controlling the glottic aperture is an important factor in the causation of these phenomena. The troublesome attacks so frequently observed after drinking are also to be attributed in part to the same cause, and in part to the enfeeblement and incoördination of the muscles of deglutition.

Having drawn attention to the nature of the physical signs indicating partial or complete paralysis of the diaphragm, it behooves us to consider what, if any, changes occur concurrently in the lungs, and what evidence can be adduced in support of their dependence on the paralysis of the diaphragm.

In fourteen out of fifteen cases there was some evidence of disturbed function of the lungs. But the notes of some of them are, unfortunately, so incomplete in this direction that it is impossible to estimate, with any approach to accuracy, the full significance and relative frequency of the several signs observed.

Weak breathing over the bases was noted in five cases.

Bronchial or tubular breathing in six cases, with or without elevation of temperature.

Percussion dulness in four cases.

Moist râles over the backs in nine cases.

In other words, there was evidence in a majority of the cases of imperfect entrance of air into, and of some œdema of the hinder part of the lungs, more especially toward the bases, with condensation or consolidation of the organs in several of them. This state was, no doubt, to some extent aggravated by feebleness of circulation, and by the enforced maintenance of the dorsal decubitus for a prolonged period; but the sequence of events in many cases, quite apart from post-mortem evidence, was always strongly suggestive of a causal relationship between the lung condition and enfeeblement of the diaphragm. This is well illustrated by the cases recorded above.

In Case I., breathing was normal on admission; the heart irregular.

On the third day the diaphragm became paralyzed, and the heart more irregular and tumultuous. On the fourth day there was more dyspnoea, and air was entering imperfectly at the bases of the lungs, but no râles were audible. On the seventh day there was a fresh attack of dyspnoea again, attended by cardiac irregularity, and the signs of diaphragmatic paralysis became accentuated, whilst the temperature began to rise. On the eighth day the dyspnoea was much increased, and consolidation and œdema râles were detected at the right base. Throughout the illness the ribs were expanding freely. After death, on the tenth day, both lower lobes were found completely airless, and studded with patches of broncho-pneumonia.

This patient was not on his back more than ten days, so that decubitus can have had but little to do with the state of his lungs, and it is not easy to see in what way feebleness of the circulation could have induced wholesale pulmonary collapse. It is far more likely that the transient attacks of heart-failure were caused by the more or less sudden collapse of successive portions of the lungs, whilst the sudden aggravation of all the symptoms, with rise of temperature on the eighth day, finds a sufficient explanation in the onset of pneumonia of the right-upper lobe, and patchy pneumonia on the bases. On the other hand, it stands to reason that if the diaphragm fails to descend (contract) efficiently, there will not occur within the chest a sufficient lowering of pressure to overcome the elasticity of the lungs, and admit of their proper expansion, and it is reasonable to suppose that such an effect would be more immediately exerted on that part of the lungs in the neighborhood of which it occurred. This view affords a rational, and, I believe, a true explanation of the manner in which collapse occurs in these cases.

In Case II. the diaphragm became gradually paralyzed on the thirteenth day, but, judging by the incomplete character of the physical signs, the loss of function was only partial, and the over-action of the ribs was apparently able to compensate it. The patient improved somewhat under artificial respiration from the fourteenth to the eighteenth day, although the paralysis of the trunk muscles was still on the increase. On the nineteenth day there was a bad attack of cardiac failure, from which the patient did not rally completely. From this moment there was evidence of total paralysis of the diaphragm, but it was impossible to ascertain whether this event preceded or accompanied the heart disturbance. Shortly afterward weak bronchial breathing was made out over the bases, and rapid œdema of the lungs set in under observation. I have little doubt that in this case also a necropsy would have revealed extensive collapse and œdema of the bases.

Case III. developed diaphragmatic paralysis on the fourth day. Three days later there were signs of œdema and collapse of both bases (relative dulness, weak breathing, and moist râles, without elevation of

temperature), with occasional slight cardiac irregularity. On the fifteenth day the collapse of the right base appeared to be considerable. The abdominal note reached as high as the sixth rib in the nipple line, and the lung note ceased at the fourth rib. He began to improve on the twentieth day. Air began to enter the right base more freely as soon as the diaphragm showed signs of returning activity, and the lower level of the liver dullness simultaneously descended from the sixth rib to the normal level in the course of five or six days. It will be observed that the right lung was chiefly affected, and that from the eighteenth to the twenty-third days the type of breathing was upper costal, the lower ribs gradually resuming work after that date. It is probable that in this case the right half of the diaphragm suffered more than the left, and that the effect on the subjacent lung was intensified and extended by the loss of function of the lower ribs. The ultimate recovery of this patient was, I believe, materially assisted by the systematic performance of artificial respiration.

Case V. was admitted with profound affection of the diaphragm and evidence of marked œdema of the lungs. After death, which occurred on the sixth day after admission, the bases of both lungs were found to be collapsed in almost their whole extent.

Evidence of a similar kind could be obtained from any one of the cases in the series, if it were desirable. But I think the references just made are sufficient to establish relationship between paralysis of the diaphragm and loss of function in the subjacent lung. It is not contended that collapse invariably results, but rather that *the loss of function in the lungs is, ceteris paribus, proportionate to the degree of paralysis of the diaphragm.*

I will now briefly relate two cases which indirectly confirm the view just enunciated, and tend to show that it holds good for other parts of the thorax.

CASE VI.—Joseph H. was admitted under my care at the North-eastern Children's Hospital in May, 1886, with well-marked diphtheritic paralysis of the trunk and limbs. On the tenth day some irregularity and increased frequency of pulse were noted. Meanwhile the paralysis was becoming more profound, and the cough was altogether ineffectual and non-explosive. There is no detailed note as to the character of the respiratory movements, except that "the movements of the ribs appeared to grow less day by day."

On the seventeenth day respiration suddenly became embarrassed, and lips and extremities cold and bluish. Examination of the chest showed that the right side was practically immobile, with the exception of the two or three upper ribs. The percussion note was much impaired over the right front and base. At the apex in front the breathing was loud and tubular, weak over the middle lobe and almost inaudible at the base; behind, above the level of the scapular angle, the breath sounds were fairly loud and bronchial. There was no pain of any kind,

and the temperature was not raised more than a degree. On the eighteenth day the child was much weaker; there were impaired resonance and weak tubular breathing, without râles, all over the right front, and exaggerated breathing over the left lung. The heart was not displaced; the backs were not examined. The movement of the right half of the chest was only just appreciable, and the epigastrium receded during each inspiration, whilst it bulged slightly during expiration, and more distinctly so during cough, which was very frequent and ineffectual. The temperature was beginning to rise (100°), the pulse 144, and more thready. During the next two days the child grew worse, and the temperature rose gradually to 102.4° . On the twenty-first day, however, the case began to look more hopeful. The change for the better was rather sudden, and amongst the first favorable indications were a return of movement in the right chest and a rapid disappearance of the signs of diaphragmatic paralysis. Examination of the backs revealed bronchial or tubular breathing over the right apex and posterior apex of the lower lobe, and distant weak breathing at the extreme base of the right side, and exaggerated breathing over the left. On the twenty-fifth day the two sides of the chest moved equally. Three days later, the breathing at the right apex had lost its tubular quality, and from that time recovery was uninterrupted.

Commenting on this case in the *Lancet* (1887), I inclined, somewhat hesitatingly, to the opinion that the lung was in a large measure collapsed, but only hinted at a possible relation to muscular paralysis. Looking back on this case now with the light of subsequent experience, I have little or no hesitation in attributing the physical signs to wholesale collapse of the right lung, induced by the immobility of the right half of the chest and the paralysis of the diaphragm.

It does not seem necessary to invoke the aid of paralysis of the pneumogastric to account for these phenomena. To begin with, it is not very clear in what way paralysis of the bronchial muscles could produce collapse of the lung, although it probably tends to promote œdema by its indirect effects on the local circulation; and, moreover, the occurrence of the physical signs under consideration in those portions of the lungs alone which are subjacent to a paralyzed chest-wall renders it highly improbable that they are dependent on causes acting within the lung itself. On the other hand, the expansion of the lungs is in large measure a purely physical process, and it seems to me that the mechanical defect in the apparatus which must occur as a result of paralysis of the chest-wall adequately explains the changes which have been found.¹

The second case, to which my attention has been directed quite

¹ It is of interest to note in this connection that in a series of experiments upon animals to determine the effects of section of the phrenic nerves, Drs. Hare and Martin, of Philadelphia, inform me that "the lungs were found collapsed in those cases in which death occurred as the result of section of the phrenic nerves."

recently, is also of great interest. It was communicated to the Clinical Society of London in 1876, by the late Dr. J. Pearson Irvine, under the following suggestive title: "A Case of Diphtheritic Paralysis Simulating Extensive Lung Disease,"² of which the following is a brief abstract.

CASE VII.—Y. W., a girl, aged six years, had suffered from symptoms of bronchitis for fourteen days. A brother, aged four years, had died six weeks previously of scarlet fever, and on close inquiry it was subsequently ascertained that both he and the patient herself had had diphtheria at that time. Her illness began rather suddenly with short frequent cough and considerable dyspnoea. She was taken off her feet almost at once. She was feverish the first two or three days, but had suffered no pain.

When first seen she was dull and listless of aspect with a queer look about the eyes, and a drooping head. The temperature was normal, the respirations (14) shallow, slow, but not laborious. She had a continuous cough, as though to clear the throat. There was decided flattening of both infraclavicular regions with almost complete absence of movement. The flattening was extensive and uniform, and it appeared as though the upper part of the chest had fallen in. The bases expanded unusually fully, and there was a strong action of the diaphragm (*sic*). There was marked loss of resonance above and under both clavicles as low as the third ribs, and on each side toward the sternum it terminated at the level of the second ribs in absolute dulness, in what appeared to be an increased area of superficial cardiac dulness. In the supraspinous fossa there was what appeared to be absolute dulness, but the rest of the back was resonant, the bases, indeed, being abnormally so. Every variety of bronchitic r le could be heard. At the apices there were loud sonorous r les not concealing what seemed to be true tubular breathing. There was clear whispering pectoriloquy at both apices.

Four days later she was again brought to the hospital, having been worse in the interval. The chest signs were unchanged, the temperature remained normal. Pulse 60, respirations 14. No distress. The head drooped more, and there was decided left strabismus. The paralysis of the trunk and limbs was also more marked. The speech had become thick and nasal, and on swallowing there was distinct pharyngeal gurgling. The flattening was pointed out to the mother, who at once remarked that the child had been remarkably full chested before the present illness.

She was in much the same state when next seen three days later. A week after this there was a striking change. The head was all but erect, the squint had nearly disappeared, the walk was no longer ataxic, and the child was quite cheerful. The improvement occurred quite suddenly. There was now an increase of resonance below the clavicles, and a distinct diminution of dulness around the cardiac area. The breathing was tubular at the right apex, weak elsewhere, with a complete absence of r les. The upper regions of the thorax still moved imperfectly. A fortnight later she was to all appearance quite cured. There still remained some impairment of movement below the clavicles, but these regions had now become more prominent. The lung gradually invaded the area of increased cardiac dulness, which became reduced to normal dimensions. Tubular breathing below the right clavicle persisted for some time longer.

Commenting on this case Pearson-Irvine makes the following remarks:

"The disease was peculiar in many respects, particularly as regards the bronchial attack, which seemed to be so extensive as judged by physical signs, and yet so unlike in its general symptoms and course to that of an ordinary general catarrh of the tubes . . . All the physical phenomena met with

² Clinical Transactions, vol. ix.

at the upper parts of the thorax appear to me to have been due to a paralysis of the muscles concerned in the elevation and expansion of these parts.

"In consequence of this paralysis and the increased action of the diaphragm not only were the apices reduced to the expiratory condition, but even to a condition of temporary collapse, or one allowing accumulation of secretion, so that there were flattening and loss of resonance with tracheal breathing, and also retraction of the edges of the lungs, with consequent increase of the cardiac dulness. And while the symptoms of bronchitis might in part be due to this same cause, I would ask whether a paralysis of the muscles of the bronchial tubes could not better explain this condition. . . . The bronchial symptoms also disappeared suddenly, as if from a sudden recovery of the ataxic muscles, while the changes ascribed to paralysis of the external muscles continued for some time afterward."

This case appears to me strongly to support the view put forward in this paper, for in it the upper portion of the lungs was placed in very much the same circumstances as were the bases in those cases in which the diaphragm was paralyzed; and the condition of the apices, as far at least as can be judged by physical signs, bore a very close resemblance indeed to that revealed post-mortem in Cases I. and V., and which, I believe, was present in varying degree in all the others.

As I have already suggested, the state of imperfect expansion (or of partial or complete collapse) into which the subjacent lung is thrown by paralysis of the chest-wall or diaphragm, is just such a one as to favor the occurrence of local œdema, quite apart from paralysis of bronchial muscles, while the extra work put upon the right side of the heart when the collapse is extensive, is well calculated not only to aggravate the local condition, but to cause œdema to become general throughout the lungs. Such an event is all the more likely to take place in cases like these where the heart is often already weak, and not in a state to bear any additional strain.

To recapitulate, the facts brought forward are held to justify the conclusion that *paralysis of the diaphragm or other parts of the chest-wall tends to induce loss of function in the subjacent lung, which is, ceteris paribus, proportionate to the degree of paralysis, and results in more or less collapse and œdema of the pulmonary tissue.*

It may be objected that the immobility of the chest-wall which is held to be instrumental in producing collapse of the lung is, in reality, a secondary event, a result and not a cause of collapse, just in the way that the chest-wall moves relatively little over a lung which is rendered inactive by consolidation or extensive adhesions. The answer to such an objection is, that, were it true, there should have been diminution of movement, if not actual recession, of the lower ribs in Cases I., III., and V., for instance, in which the pulmonary bases were certainly either collapsed or consolidated, and not a distinct increase of movement, such as was actually observed.

It is not my intention to enter here upon the question of the general treatment of diphtheritic paralysis beyond remarking that the super-

vention of respiratory paralysis renders it more than ever imperative to take every possible precaution to guard against the occurrence of broncho-pneumonia. There are, however, one or two special points which are worthy of notice in this connection.

1. Allusion has already been made to the frequent and ineffectual cough, and to the fact that it is often incited by attempts to swallow. The adoption of tube-feeding has often proved of great value in allaying this distressing and exhausting symptom. It should be put into practice as soon as swallowing is followed by attacks of coughing. A soft red-rubber catheter of suitable size introduced through the nose answers the purpose admirably. The manœuvre is of the simplest, and can be performed by any intelligent nurse, and the children very soon become reconciled to the operation. In addition to relieving cough, and enabling the quantity of food to be regulated to a nicety, this plan has the further advantage of preventing the leakage of food-stuffs into the air-passages, where they act as an irritant which the patient is generally unable to expel, and also tend to favor the occurrence of collapse.

2. I should like to say a word on the systematic employment of artificial respiration in these cases. Possible efficacy of this mode of treatment was first suggested to me by the condition of the lungs in Case I. For if collapse, resulting primarily from physical inability to expand, is the morbid state of lung to be contended against, any rational treatment must have for its object to assist expansion to the utmost. Here, as elsewhere, there is unfortunately the same difficulty in estimating what proportion of improvement is to be attributed to the treatment adopted, and what to the gradual evolution of the disease toward recovery. But I am satisfied that in several cases the ultimate recovery of the patients was materially assisted by the treatment, although in others it appeared to produce no effect, and on two occasions had to be discontinued on account of the discomfort to the patients. It was tried in ten cases, of which five recovered and five died. Until a more extended trial has been made it would be premature to express a decided opinion concerning it, but I have no hesitation in recommending others to try it.

Artificial respiration (Sylvester) should be commenced on the first appearance of any indication of paralysis of the diaphragm, for it should be borne in mind that the object in view is not so much to treat symptoms of asphyxia, etc., as to prevent, if possible, the condition of lung which gives rise to them.

In hospital the treatment is carried out by the nurses three or four times in the twenty-four hours, according to the severity of the symptoms, for a period of ten or fifteen minutes. Great care is always taken to disturb the patients as little as possible, and not to uncover them more than is absolutely necessary.

In conclusion, my best thanks are due to my colleagues, Dr. F. Charlewood Turner and Dr. Armand Semple, for their kindness in allowing me to examine patients under their care, and to make use of their case-notes.

A SERIES OF THIRTY CLINICAL LAPAROTOMIES.

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I HAVE found considerable difficulty in arranging the title of this paper, and I do not know that the heading expresses exactly its scope. The method of operating is something of an innovation, in that the laparotomies are done in the public clinic-room, before several hundred students. These cases are presented under the supposition that their care and results may be of interest, and I have gathered all the clinical cases that have come under my control during the past two winter sessions, covering a period of about eighteen months, and operated upon by me at the public clinic of Rush Medical College.

CASE I.—M. M., aged twenty-two, American, school-teacher, referred by Dr. Going, family and previous history good, presented herself for treatment with a large tumor of the abdomen. The tumor was first noticed by the patient, a year previous to her coming under my charge, as a small lump in the lower portion of the abdomen on the right side. During the last four months it had increased rapidly until it filled the entire cavity. There was nothing peculiar about it in any way. It was diagnosed as a probable single large ovarian cyst, and operation advised, which was consented to, and done before the class at the College, November 3, 1888. There was nothing found after abdominal section except a large ovarian cyst; no peculiarities, no adhesions. The patient went on to complete and perfect recovery by primary union, without interference or rise of temperature. Discharged cured November 30, 1888.

CASE II.—The next operation was done December 1, 1888. Mrs. P. V., aged forty-two; married fifteen years; two children; American; housewife; family and previous history good; referred by Dr. J. G. Conley. The patient had been suffering for the past two years; the history was that of an ordinary ovarian cyst, nothing uncommon being determined by examination. Abdominal section and tapping of the cyst showed the contents to be of a chocolate color. It contained sixteen pounds of fluid. There were a number of adhesions to many of the surrounding organs, but these were separated without difficulty and the tumor entirely removed. No well-defined pedicle could be found, the tumor being nourished apparently by its adhesions. In this case no unfavorable symptoms arose in the course of recovery, and she was discharged cured three weeks after the operation.

CASE III.—The next operation was done March 26, 1889. Mrs. H. G., aged forty-six; American; housewife; family and previous history good; married twenty-two years; three children. Patient first

noticed the appearance of the tumor six years ago, the first evidence of trouble being pain in the lower portion of the abdomen; and in a few months she discovered a small lump in the right side, which grew rapidly in the last months of its development, accompanied with severe pain. Upon abdominal section the tumor was found to be universally adherent. This was a case requiring the greatest care in the separation of the adhesions from the uterus, broad ligaments, bladder, and all surrounding parts, the operation being necessarily slow and occupying about one hour. Notwithstanding that this was a public operation and one of the most difficult that surgeons meet with, this patient went on to perfect recovery without a rise of temperature beyond 100°.

CASE IV.—Was operated upon April 27, 1889. Mrs. F., aged thirty-five; French; housewife; family history good; referred by Dr. O'Shea. This patient had suffered for many years, and had been under the treatment of many physicians, without relief that was satisfactory. She was relieved by rest in bed, but the moment she assumed the erect position and attempted to do her work the old trouble returned. Upon examination there was easily discovered an enlargement in the neighborhood of the ovary, and an operation was advised. This enlargement was not greater, perhaps, than an orange, but the patient was very fat, and under the circumstances, with the abdominal surface loaded with fat, especially in a patient who had never been pregnant, whose abdominal walls had never been distended, an operation of this kind is attended with many difficulties. This patient went on to perfect and complete recovery without rise of temperature. Discharged cured May 30th.

CASE V.—On May 4, 1889, I had another multilocular ovarian cyst with adhesions. H. K., aged nine years; German; school-girl; family and previous history good; duration of present disease five months. Five months ago a small tumor was noticed in the abdomen. This increased very rapidly, attaining a diameter of eight inches after removal. Its pressure upon the rectum made it very difficult to secure an evacuation of the bowels, the large intestine being filled with masses of feces at the time of operation.

The abdominal section showed universal adhesions, which were difficult to manage. The patient did well until the third night, when she became restless, got out of bed and sat in a chair, the nurse being asleep. From this time she began to sink, dying from exhaustion on the fifth day. The autopsy showed the wound and the abdominal cavity to be in a perfectly normal condition. Previous to the operation cathartics and enemata had not secured an evacuation of the bowels; this not only increased the difficulty of the operation, but gave the patient more to bear after it.

CASE VI.—The next case was one of papillomatous cyst. Mrs. S., aged thirty-two; American; housewife; family and previous history good. This patient gave a history of having found, six months previous to appearing at the clinic, a small tumor in the abdomen, which did not seem to increase in size, but the abdomen became rapidly distended, so that when she presented herself for examination it was as large as at full term of pregnancy, and full of fluid. No tumor could be found by external examination, but with the history given by the patient of having found a tumor before the abdomen became distended, and by vaginal examination, it was possible upon one side, I think the right, to get a

very indistinct impression, through the fingers, of the presence of some hard substance high above the vaginal roof, and a diagnosis was made of probable ovarian cyst, and an operation advised and consented to. At the abdominal section a large quantity of free fluid was discharged from the abdominal cavity, and as soon as this was emptied there appeared the source of trouble. Here, again, was one of the most difficult cases to be met with under any circumstances. The entire pelvic cavity was occluded by a mass of papillomatous growth, which obscured from view at first the exact position of the uterus and bladder. There was also present in this case something which I have not met before; after the fluid was emptied I felt in the peritoneal cavity a mass of soft material the nature of which I could not distinguish with my finger. Finally, I got it through the opening in the abdominal wall, and pulled out a mass of papillomatous growth as large as my fist, which was attached to the rest by means of a pedicle as large as ordinary twine. How this mass could be nourished through it I could not imagine. Those familiar with these cases know that the surgeon will be able to find somewhere a separation between the cyst wall and the surrounding tissues of the pelvic cavity, and as soon as the fingers get into this opening it will be rather easy to deliver the tumor. Of course, the hemorrhage is pretty free at first, but it is to be remembered that as soon as the separation is completed, no matter how universal the adhesions seem to be, and the base is tied, the bleeding ceases. There were many raw surfaces left after the separation, which were covered as much as possible by fastening together neighboring portions of normal peritoneum with continuous catgut sutures. A glass drain was used. This case, difficult as it was, went on to recovery without any rise of temperature exceeding 100° F. Discharged cured September 27, 1889.

CASE VII.—The next case, operated upon August 17, 1889, was a small fibroid in the posterior wall of the uterus, and cystic left ovary. Mrs. B., aged thirty-seven; American; housewife; referred by Dr. Munroe. This case is of no particular interest; there were no difficulties whatever attending this operation, consisting in abdominal section and removal of left ovary; she went on to perfect recovery, and was relieved of the principal symptom of which she complained, severe and periodical attacks of nervousness, which seemingly had not been amenable to treatment of any kind during several years in care of physicians. Discharged cured September 7th.

CASE VIII.—The next case is certainly one of interest. The operation was done September 28, 1889. Mrs. I.; American; housewife; forty-three years old; family and previous history good until two years ago.

Oöphorectomy was done for a peculiar kind of epilepsy, which had existed for two years, coming on at every menstrual period, and showing no tendency to manifest itself at any other time. At first the attacks were slight, and hardly noticeable by the patient or her friends, but they so increased until when the patient came to see me at the hospital she had had every operation done upon her that could be done, so far as the external genitalia was concerned, and notwithstanding the fact that she had, apparently, received all the care that physicians ordinarily give to a patient, she still had these convulsions, and they had increased to such a degree that she had as many as ten positive epileptic convulsions in a day. They never came on until menstruation began, and they ceased

with menstruation. I thought in this case there was a very plain indication for causing the cessation of menstruation, if possible, bringing about the menopause as early as could be done. She was advised to have an operation done for the removal of the ovaries and tubes, and this was performed. The stitches were removed on the seventh day. She had no trouble from the operation. She stayed in the hospital for three months, and during that time she had a slight convulsion on the second return of the period of menstruation. On the third return she had three convulsions, which were rather severe, the first day of menstruation. Between that and the next return of menstruation she went home. I have received letters every month from the husband. She has had no convulsions whatever, but the occurrence of the convulsions is supplanted by increased nervousness and restlessness at the time of menstruation. But the husband says in his last letter that this has begun to subside.

CASE IX.—Mrs. S.; forty-five; previous and family history good. Five years ago patient noticed a small lump in the lower part of the abdomen, which increased very slowly in size until four months ago, since which time it has grown rapidly. Menstruation has been irregular, and entirely absent for four months.

The pedicle was very broad and short. The first ligature did not entirely control the hæmorrhage, so a second one had to be applied. The patient recovered normally, being discharged three weeks after the operation.

CASE X.—The next case was a small twelve-pound ovarian cyst, operation done October 15th.

There was nothing unusual about it in any way, the patient's recovery being normal and perfect throughout, without rise of temperature.

CASE XI.—On October 19, 1889, another interesting case was operated upon. A. M., aged nineteen; family and previous history good; duration of present disease four years.

The patient presented herself with an extensively distended abdomen, and with this history: Four years ago she began to have some abdominal distention, which went on rapidly for a year, when she was tapped, and thirty-two pints of fluid withdrawn. It filled up again in the course of the next year with the same amount of fluid, and the same in the third year, and finally in the fourth year she came under my care, and I decided to do an operation for removal of the cyst. In making the vaginal examination in this case I could feel through the roof of the vagina a hard substance of some kind, which ran obliquely across the pelvis, from right to left, just as though a lead pencil were placed across; so I concluded that the case was one of dermoid cyst, containing bone. The tumor with contents weighed forty pounds. The patient went on to complete recovery. The tumor displays the superior maxillary bone, the nasal bone, and part of the frontal and malar bones; and in part of the upper jaw tissue one is able to discover teeth. The tumor is interesting because of the mass of bone tissue found within it. The patient was discharged perfectly well November 12, 1889.

CASE XII.—The next case was one of ruptured papillomatous ovarian cyst; operation done December 9, 1889.

There was nothing about it of special interest, except, perhaps, that there were so many adhesions and raw surfaces left in the pelvis and abdominal cavity that I deemed it proper to use a drainage tube. The

patient was discharged January 13, 1890. Three months later she is reported as having some evidence of return of disease.

CASE XIII.—The next case was an ovarian cyst; nothing noticeable in connection with it; operation February 8, 1890. M. F.; aged twenty-four; family history good, except that father died after an operation for the removal of a tumor, and a sister died of tuberculosis. Previous history good.

Ovariectomy was done very quickly, the entire operation lasting twelve minutes. This girl presented herself with a cyst, which we found subsequently contained thirty pounds of fluid, but so far as the girl's appearance went there was nothing to call attention to her as being diseased or sick in any way. It has been proven to me on several occasions that when the general health is not affected by the tumor it will not have many adhesions; but when the patient is emaciated, and the general health suffers, there will be adhesions. Discharged March 14, 1890, cured, not having had an unfavorable symptom.

CASE XIV.—The next case was a small ovarian cyst of right ovary and inflamed left tube.

The operation was done March 11, 1890, and she went on to recovery without difficulty. Discharged cured, April 5, 1890.

CASE XV.—The last ovariectomy was for a cyst of the broad ligament, containing eighteen pints of fluid. Mrs. W. H. D.; aged sixty-one; family history of tuberculosis and carcinoma; previous history good; duration of present disease two years.

Tumor was at first very slow in growth, but during the last five months very rapid. The tumor was peeled out of the broad ligament as an entire cyst, the edge of the broad ligament being tied and dropped. The patient has gone on from the day of operation until the present time without any interference whatever—in fact, says that she feels much better since the operation than before. Note: Discharged cured, April 15th.

CASE XVI.—The next operation was done April 16, 1889. It was a case of ectopic pregnancy. The patient, Mrs. H., who was referred to me by Dr. O'Shea, of this city, was twenty-six years old, and had one living child, eight years old, and three miscarriages. Three months before coming to me she supposed herself to be pregnant; she had missed a term, and in the interval before the second time of menstruation she was seized with severe pains in the pelvis, had symptoms of shock and prostration, and a bloody vaginal discharge. A physician saw her, and detected on vaginal examination a mass on the left side of the uterus, with a considerable swelling projecting up into the abdominal cavity. In a few days she was again seized with the same colicky pain in the pelvis, and again had a bloody vaginal discharge. She was brought to the hospital and placed under my care, and I diagnosed ectopic pregnancy. An operation was done for its relief, before the class. The abdomen was opened and the ruptured tube discovered. After the removal of great masses of blood, the tube and sac were opened freely; no fetus was found, but parts of the placental tissue were found, removed, and examined. In this case I thought it was too hazardous to attempt the removal of the Fallopian tube; so the opening that was made in it was stitched into the edges of the abdominal wound, and then all the accumulated blood was scooped out of the cavity by the fingers and other means, and the cavity filled with iodoform gauze. At

intervals of two or three days, portions of the gauze were removed until the cavity finally shrivelled up and closed. The woman left the hospital well, and remained well.

CASE XVII.—The next operation was done March 4, 1890. Mrs. S. J., forty years old; previous history good. Referred by Dr. Palmer. The history is similar in the development of evidences of pregnancy and the commencement of symptoms of rupture and the time of operation. In both of these cases there had been a long interval between the last pregnancy and the occurrence of this supposed pregnancy, in the first case eight years and in the last case nine years. This is an important factor in these cases; I think Mr. Tait insists that it is one of the principal signs to be remembered. In many of these cases there is this history of a long period of years between pregnancies, then the cessation of menstruation, then comes the history at the end of two months of severe colicky pain in the lower portion of the abdomen, this extreme pain causing shock and prostration, all the evidence of blood-loss and vaginal discharge, and in many cases the discharge through the vagina of the decidua; as in this case, the patient told me that pieces of skin were discharged through the vagina. There were found in the abdominal cavity large masses of blood filling up the pelvis. The Fallopian tube upon that side was ten times its normal size, with an opening through which protruded large clots of blood. These were all cleaned out, and a ligature thrown around the Fallopian tube between the sac and the uterus, and the tube removed. In this case, as I had cleaned everything out and then removed the sac, there was nothing to sew to the abdominal walls. Here was a large cavity with little particles of blood that I was afraid to leave inside by closing the abdominal wound, so I filled the cavity with iodoform gauze and let the intestines come down against it and sewed up the wound above the gauze. This gauze was left in several days without any disturbance, because the patient showed no reason why there should be any disturbance of it; then we commenced to pull the gauze away; every day a piece was removed, and it kept perfectly sweet and clean. The abdominal wound is healed, and the patient was discharged cured on April 26, 1890.

CASE XVIII.—Mrs. A. L., aged thirty-three; family history good; previous history good until date of marriage, twelve years ago. Referred by Dr. Munroe. Operated on June 8, 1889, for pyosalpinx. Discharged September 3, 1889.

CASE XIX.—Operation, September 28, 1889; discharged November, 1889. Mrs. H., aged twenty-five; family history tubercular; previous history good until one year ago. Referred by Dr. Knox. The disease commenced with severe pain in the lower part of the abdomen. A swelling appeared in this region, evacuating a large amount of pus through the bowels, which had been repeated several times. There was a resonant tumor in the right iliac region, just above Poupart's ligament. Abdominal section disclosed a right pyosalpinx with universal adhesions. The sac could not be drawn up into the abdominal incision. An opening was made into the abscess from the vagina by means of a pair of long curved scissors, guided by the hand in the abdominal cavity, and a rubber drain was introduced. In doing this, the bladder was wounded. The abscess drained nicely; the wound of the bladder healed under the use of a retention catheter for one week. The abdominal wound healed normally.

CASE XX.—Operation, January 7, 1890. Mrs. S., aged forty-four; three children; family and previous history fair. Seven months ago, first felt tenderness in the lower portion of the abdomen; a month later, first noticed some swelling. Patient was treated in Cook County Hospital for three months; lost much flesh, became very weak, had febrile attacks, the evening temperature reaching 101° . Incision in the median line, aspiration of eight ounces of pus, sewing of sac to abdominal wall, free opening of sac, introduction of drainage-tube and iodoform-gauze tampon. Abdominal wound healed and the abscess cavity drained well, a sinus containing a drainage-tube and discharging a small amount of pus still persisting.

I do not know that much need be written about these three cases; they were all pyosalpinx and pelvic abscesses, and all recovered. I imagine that anyone who has much laparotomy work to do will bear me out in saying that these cases of pelvic abscess very frequently present difficulties that are troublesome to overcome, even in an ordinary operating-room, surrounded only by assistants, because they are so apt to be surrounded by adhesions. These cases presented no particular difficulties, except in two of them, from an old opening into the rectum there had come, in one on the right and in the other on the left side, a tumor, circumscribed in character, well out toward the ileum, in one case below Poupart's ligament and in the other above, which was tympanitic, crackling under pressure of the finger, showing the presence of gas, yet not enough pus in their formation to cause them to come to the surface and ulcerate through. In both cases laparotomy was done. The third case was peculiar in that it showed a disposition to go above the pelvis toward the abdominal walls. The woman had been in several hospitals, and I had decided that, notwithstanding it was high up, with its acute course, tenderness, and peculiar feel, there was pus in it, and I advised her to have abdominal section done to find out, and we did find it. The cyst wall was fastened to the abdominal wall, and the cavity packed with iodoform gauze. She recovered without difficulty.

CASE XXI.—The next case was a cyst of the pancreas. Mrs. W. E. S., aged twenty-four; family and previous history good. The operation was done December 11th. Four years ago this patient noticed a small, round tumor in the neighborhood of the pancreas. It did not show much disposition to increase in size, at first. Two years ago, she became pregnant, and during the pregnancy it did not show any disposition to grow; but after delivery it grew rapidly, so that when she presented herself the upper half of the abdominal cavity was filled with a fluctuating tumor. It could be differentiated as belonging to this portion of the abdominal cavity because the resonance was all below, and it could be diagnosed as a post-peritoneal growth, from the fact that, here and there, by careful percussion over the surface, circumscribed resonance could be determined, marking the course of the intestines between the abdominal walls and the tumor. It was diagnosed to be a pancreatic cyst, partly from the history and partly from the examina-

tion. An incision was made through the abdominal walls, and, as soon as the intestines made their appearance the diagnosis was complete. Crossing over the surface of the tumor were many large veins and arteries from the mesentery and the omentum. Now, when I have a doubt about any sort of growth or cyst, especially if its contents are harmful, I carry out the same plan as carried out with reference to abdominal abscesses—*i. e.*, to shut off the peritoneal cavity first, so it will not be affected by anything that comes out of the cyst. The cyst wall was fastened by sutures to the centre of the incision all the way round. Then the abdominal incision was closed up to this point, and an opening made, and twelve pints of clear, yellowish fluid discharged, which proved to be pancreatic. The cavity was washed out thoroughly, until the fluid came out clear, and then was packed with iodoform gauze, which kept it perfectly aseptic. This gauze was removed from day to day, the cyst wall shrivelled up, and the cavity disappeared, and the patient was cured at the end of two months. She has since remained well.

CASE XXII.—Mr. J. G. K., aged thirty-two; family and previous history good. Referred by Dr. Collins. Male patients represent my point as well as do female patients—*i. e.*, the doing of these operations before large assemblies. This was a large papilloma of the kidney. He came to us with a greatly distended abdomen upon the right side, with the history of a growth commencing posteriorly just below the ribs and extending downward to the ilium. It seemed to fluctuate, and was very elastic. An incision was made, to uncover it, and according to the methods I have already described. The post-peritoneal covering was stitched to the abdominal edges, and an opening was made into the mass. It was found not to be fluid, but to be a mass of papillomatous degeneration connected with the kidney. If there ever was a case which demonstrated the beneficial effects of this manner of treating large cavities and keeping them from septic trouble, this was the case. Nothing could be more likely to take upon itself septic action. This large cavity was filled to overflowing with iodoform gauze, and there never was any septic trouble, the cavity filling up quickly and the gauze being removed as it filled up. The patient recovered entirely from the operation, and was discharged after three months, a sinus remaining.

CASE XXIII.—Mrs. B., aged twenty-six; mother of two healthy children; family and previous history good.

This woman came to me with a tumor of the left kidney as large as a cocoanut. The diagnosis was made; its position determined by the rules we carry out in these cases. It proved to be an adenoma of the left kidney. It is interesting as showing that the mass of kidney had been thinned out, and that the cavity is filled up with the tumor. This tumor was removed by the anterior incision opening carefully into the peritoneal cavity, making an incision in the posterior peritoneum to the outer side of and in the course of the descending colon, carrying the colon over to the right, exposing the kidney and removing it, making drainage through the posterior wall by passing scissors through the interval between the last rib and ilium. This woman was four months pregnant when this operation was done, but it caused no trouble, and she went on to full term and was delivered of a healthy child and recovered. Patient discharged cured at the end of eight weeks, and was able to do her own housework.

CASE XXIV.—Mrs. F., aged forty; family and previous history good. Referred by Dr. Bryan. It was a large uterine myoma, which makes up another of the deaths in this series, but one which probably could have been avoided. Patient died May 30th, of intestinal obstruction without inflammation.

CASE XXV.—The next case, an epithelioma of the uterus, was removed by vaginal hysterectomy; operation September 24, 1889. Mrs. H., aged forty-four; one child; family and previous history good; duration of disease, one year.

There is nothing particularly interesting in this case, except that profuse hemorrhage occurred some six hours after the operation during a fit of vomiting, and when I came to examine her I found upon the left side the tissues at the base of the forceps had pulled out and left the uterine artery free. By the use of tampons the hemorrhage was stopped and never recurred, and the patient went on to recovery. Patient discharged cured October 12, 1889.

The next cases I pass by without much reference: one a cancer of the stomach, the other of the liver and mesentery. In the first case laparotomy was done for the purpose of relieving the patient, if possible, by establishing an anastomosis between the stomach and the seat of the trouble. In the other case operation was done for the removal of a very painful carcinomatous nodule at the umbilicus. It may be well for me to say that cases of development presenting a very hard, tense, somewhat circumscribed mass, embracing the umbilicus and surrounding tissue of the abdominal walls to a slight degree, accompanied by extreme emaciation pointing to severe and troublesome disease, will almost always indicate the presence of carcinomatous disease affecting the liver.

CASE XXVI.—Operation April 2d, died April 3d. Mr. S., aged fifty-three; carpenter; family history excellent; previous history, many years dyspepsia. Present symptoms those of carcinoma occluding pylorus; patient extremely emaciated, not having taken nourishment by mouth for weeks. Operation gastro-enterostomy. Patient died twenty-four hours after the operation from exhaustion.

CASE XXVII.—January 22, 1890. John R., aged fifty years; American; farmer; family and previous history good. Duration of disease, five months. Wound healed normally.

CASE XXVIII.—Operation October 12, 1889. Died suddenly, probably of thrombosis of pulmonary artery; autopsy not permitted. Mrs. B., aged fifty-one; family and previous history good until a year ago. Referred by Dr. Adolphus.

CASE XXIX.—Operation March 8, 1890. Mr. A. R., aged twenty-nine; family and previous history good. Referred by Dr. Bridge. Duration of disease, ten months.

Has suffered pain and tenderness in the ileo-cæcal region ten months. During this time he has had three attacks, characterized by severe pain, high fever, and increased induration in the affected region. Last attack came on three weeks ago. Treatment: incision over cæcum four inches long into the abdominal cavity. Numerous adhesions were found

between folds of intestine. A large piece of omentum, hard and contracted by inflammation, found adherent to the cæcum and abdominal walls, was ligated and removed. The cæcum was adherent throughout to the iliac fossa; the appendix could not be found. Recovery perfectly normal. Patient discharged cured April 2d.

CASE XXX.—Mr. J. L., aged forty; family history bad; previous history good; duration of present disease, several months.

The last case is one in which I did laparotomy for the purpose of relieving a distended abdomen, which examination showed to be filled with fluid. By displacing this fluid, by pretty firm pressure of the hand in different directions, it was possible to determine some nodulated masses here and there in the peritoneal cavity. Diagnosis was made of tubercular degeneration of the peritoneum, and abdominal section done for the purpose of establishing drainage and taking off the pressure from the organs, and possibly leading to the recovery reported in such cases. An operation was done and the cavity of the peritoneum found full of fluid, and the peritoneum and abdominal walls covered with nodules in all directions, the omentum rolled up into wads and these filled with tubercular nodules. Drainage was used, and the patient recovered from the operation without difficulty.¹

This presents a series of thirty cases. Of these, fifteen were ovarian, and out of the fifteen but one death. Two were extra-uterine pregnancies; both recovered. Three, pyosalpinx; recovered. One cyst of the pancreas; recovered. Two, disease of the kidney: one complete removal of the kidney, the other partial removal; both recovered. Two, disease of the uterus: one cancer with perfect recovery, one large myoma with death. Three cases of carcinoma: one of the stomach, death; two of the liver and other organs—one recovery and one death. Appendicitis, one case, one recovery: tuberculosis of the peritoneum, one case, one recovery.

Thirty similar cases in a public clinic, with twenty-six recoveries and four deaths, is a record that is rarely exceeded.

So far as ovarian tumors are concerned, the removal of a simple ovarian tumor is about the simplest operation a surgeon can do. But what I wish to call attention to principally is the fact that in different cities a great proportion of the large amounts of money that are given for hospital purposes has been expended in putting up special rooms for laparotomies, so arranged that it is impossible for microbes to get in or out. In some places the patient is as absolutely isolated as is a case of smallpox. Physicians who see the case are let in in small squads, a few at a time, into these specially prepared rooms, and this is done under the impression that something other than attention to the immediate surroundings of the patient must be done in order that the success of the operation shall be assured. But I contend that is useless; I do not believe any patient's life was ever saved by marble walls or tessellated

¹ Died about six weeks later from exhaustion.

pavements. My own belief, which I have put in force so far as these thirty cases were concerned—cases that were taken without selection, and that represented the moderately difficult and the severely difficult—is, that it is what is put into the abdomen which causes trouble, and also that it is the preparation of the operator and of his assistants, and of everything that touches the patient about the wound, from which safety comes.

It is my rule, from which I seldom depart, to have the patient under my close inspection and control three days before the operation, and during that time I try to disinfect the intestinal tract as possibly a source of self-infection. The patient is given freely of cathartics, and the intestines are emptied entirely in every way until the abdomen is as flat as it can be made, and by this means the intestines are kept out of the way during the operation. Every operator knows that when the intestines are full, or distended with gas, it is the most troublesome thing in the world to get them out of the way. The patient is put in bed and kept in bed, and I think that is important. She is given a full bath the first day before going to bed, and when she goes to bed all the hairy surfaces in the region of operation are shaven close, and then a special cleansing given over the abdomen and genitalia; this consists of three or four applications of soap and water, particular attention being paid to the umbilicus. This is very important, and should be done regularly. The line of the incision is washed with ether, and there is applied to the surface of the abdomen the night before the operation a compress of two and a half per cent. solution of carbolic acid covered with an impervious dressing, and this is left on until the abdomen is uncovered for the operation. Not only is that done, but the vagina also is prepared with the bichloride douche, which is followed by one of sterilized water. The vagina is irrigated, not only for the purpose of getting rid of anything that may be a source of infection through the vagina or vulva, but to prepare it for interference if necessary to enter it for any purpose during the operation. The instruments are all specially prepared—I believe in having a large number of instruments at hand, so as to be ready to meet any complication—by being boiled thoroughly in water. I do not think these instruments should be used for all sorts of operations. I have the same assistants, with the exception of the interne, who is always an assistant, about the case, and they are trained in the preparation of themselves, which consists in bathing with soap and water, using nail-brush freely, then with antiseptic solutions, then with soap and water, afterward covering the clothing with a gown so that the clothing is not brought into contact with the patient at the time of operation. The patient is covered with blankets passing about the shoulders and legs, leaving exposed to view only the surface of the abdomen. All these parts are covered with clean dry towels

first, then by towels wet in a two and a half per cent. solution of carbolic acid. I do not believe the wet towels should be brought in contact with the patient's body, as I think it increases the shock. I believe quinine and morphine are of benefit, so all my patients receive five grains of quinine and one-quarter grain of morphine one-half hour before operation.

Adhesions should never be torn or severed until they can be seen. I think a great deal of the bleeding that bothers surgeons comes from the fact that they cannot see what they are doing.

Silk, the sponges, and everything else that is used, should be prepared according to the best rules that are given with reference to making them perfectly aseptic. I never allow an assistant to put his hands or an instrument into the peritoneal cavity unless I direct him to do so. I keep everything out of the peritoneal cavity as far as possible. It is proper for me to say that no antiseptic solutions are ever introduced into the peritoneal cavity, even when pus is present, except sterilized water or a mild solution of boric acid.

A CASE OF GENERAL TUBERCULOSIS IN AN INFANT: PRIMARY INTESTINAL INFECTION.¹

By WILLIAM P. NORTHRUP, M.D.,
PATHOLOGIST TO THE NEW YORK FOUNDLING ASYLUM.

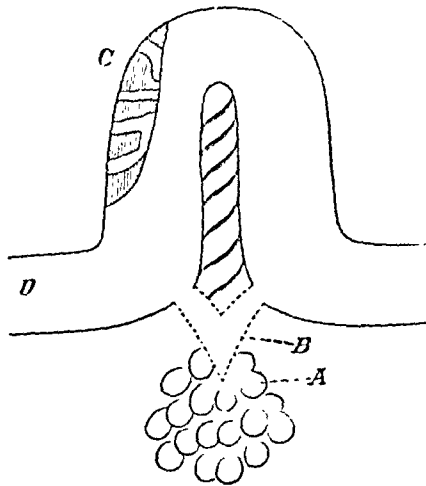
THIS case is of interest because it seems to have arisen from intestinal infection—possibly from “food infection.”

History.—The patient was a female child, aged fifteen months. When two hours old it was brought to the New York Foundling Asylum and entered upon the records of the institution as being in “good” condition. It was immediately put out to wet-nurse with a healthy, strong woman, twenty-seven years old, who brought it to the asylum every month for inspection, and the records show that for nine consecutive months it continued to thrive. Three months later, or in the twelfth month of life, it was recorded as being in “poor” condition. Seventeen days before death the child was taken from the nurse because of its miserable appearance, and kept in the hospital. It had a “bad cough,” was anæmic, emaciated, and had double suppurative otitis. For the remainder of its life it had a daily average temperature of 101° F., with diarrhœa. Three days before death the passages were frequent, dark, and occasionally contained blood. The temperature reached 104° F. The child died without convulsions. (For this history I am indebted to Dr. George S. Lynde, house physician.)

¹ Presented before the New York Pathological Society, February 26, 1890.

Autopsy.—Body emaciated. Brain and membranes normal. Lungs: the anterior portions contained a few small, glassy, discrete tubercles; the lower and posterior portions were in a condition of recent bronchopneumonia. The bronchial lymph-nodes were many of them enlarged, firm, congested, but contained no cheesy masses and no tubercles. Examination under the microscope showed hyperplasia, no tubercle tissue and no bacilli. The heart was normal. The liver contained small tubercles in moderate number, but itself was not enlarged. The spleen was small and contained a number of small, discrete miliary tubercles. The kidneys had each upon surface and on section from three to five distinct small miliary tubercles. The stomach was slightly congested, empty, and relaxed.

Intestines: opposite the middle of the ileum, within the mesentery, were eight to ten large lymph-nodes, closely grouped together; these were cheesy and had diffuent centres. The mesentery was somewhat shortened and thickened at this point, and the intestine was sharply doubled on itself forming a knuckle, its contiguous walls being adherent. Two sinuses about two millimetres in diameter, having their openings in the two legs of the knuckle, passed down into the thickened and



Schematic view of knuckle of ileum after contraction of abscess. *A.* Enlarged, tubercular, mesenteric lymph-nodes. *B.* Old sinuses, V-shaped. *C.* Peyer's plaque, ulcerated. *D.* Ileum, middle portion.

contracted mesentery in a V-shape and terminated together in a blind ending. A bent probe could be easily passed into one sinus, dipping down into the mesentery, and made to emerge at the other sinus. In this knuckle of ileum was a single ulcerated Peyer's plaque, the ulcers having characteristic undermined edges. Here, then, in immediate juxtaposition were ulcerated plaque, old sinuses, thick and contracted cicatrix, cheesy and diffuent lymph-nodes. No ulcers were observed in any other part of the ileum, and the enlargement of the mesenteric lymph-nodes, apart from the group just described, was but moderate, and none were cheesy, none tuberculous. The colon was the seat of extensive chronic catarrhal inflammation. Examination under the microscope showed thickening of the mucosa and superficial necrosis of the epithelium. The large mesenteric lymph-nodes near the sinuses were found

under the microscope to be tuberculous, having well-defined tubercle granula with large giant-cells and tubercle bacilli. The only cheesy lymph-nodes of the body were in the mesentery immediately about the cicatrix and old sinuses. The tubercles of the other organs were small, showing no tendency to degeneration, and were presumably recent.

Remarks.—The history is of a sickness lasting six months; wasting, anæmia, cough, severe diarrhœa with bloody passages. The wet-nurse was a strong, healthy woman; she is believed to have suckled the child the first nine months of its existence and then to have fed it. She bore children frequently and was again at this time four months pregnant. It seems probable that her breast-milk was about two weeks old when she took the foundling to nurse. She had borne seven children in seven years; of these four died at birth or soon after; of the three living, one was seven years old and healthy; one was four years old, pale and thin; the other, who was three years old, had Pott's disease of the spine and was wearing a brace. There was no history of any person in the house sick with a cough, and the woman's husband and father were living and said to be healthy. The rooms in which she lived were clean and light, in a large tenement house in the most crowded part of down-town New York.

What, then, was the probable course of the case, looking backward? Tubercle bacilli found their way into the intestine, probably either in infected food or through the medium of the mouth and nose secretions in which were entangled bacilli from the air. From the ileum the bacilli found their way to the mesenteric lymph-nodes and there set up the tuberculous process. The result was an abscess which emptied into the gut by two sinuses, and which, in contracting, brought the gut to a sharp knuckle. The neighboring lymph-nodes became tuberculous, cheesy, and diffuent, and from some source bacilli entered the blood-stream and were borne to other organs, and there set up a similar process. The kidneys, liver, and spleen were moderately affected; the lungs sparingly; the brain and meninges not at all.

REVIEWS.

A TREATISE ON ORTHOPÆDIC SURGERY. By EDWARD H. BRADFORD, M.D., Surgeon to the City Hospital, Boston; Samaritan Hospital, Boston; and Children's Hospital; Instructor in Clinical Surgery, Harvard Medical School; and ROBERT W. LOVETT, M.D., Surgeon to the Samaritan Hospital; Assistant Out-patient Surgeon to the Children's Hospital; Out-patient Surgeon to the Carney Hospital; formerly Assistant Surgeon to the New York Orthopædic Dispensary and Hospital. Illustrated with 789 wood-engravings. New York: William Wood & Co., 1890.

DRS. BRADFORD AND LOVETT, both accurate and reliable workers, have had unusual opportunities, not only for considering deformities, but, by reason of their location in Boston, have had exceptional facilities for following up their cases for a series of years. The hospitals with which they are associated being the only ones in Boston devoted especially to this class of cases, their patients have not drifted, as is so frequently the case in many cities, which drifting is so common a source of error in statistics.

The work shows evidence not only of personal experience, but also of wide general knowledge and research.

The first chapter, on Pott's disease, gives a comprehensive and accurate picture of this most dreaded condition, and their treatment of spinal abscess is especially to be commended. In the acute stage of spinal caries, as well as in that of hip disease, they recommend treatment by rest and extension during the acute stage, the patient being placed upon a canvas frame, which permits the removal of the case into the open air without disturbance of the dressings. Fixation by plaster-of-Paris, and other methods, are well shown, and the difficulties of securing rest in the upper portion of the spinal column are fully recognized.

Several forms of head-rest, including a number encircling the neck, which seem advisable to adopt for the purpose, are given.

In regard to operative treatment for the removal of the laminæ for pressure paralysis, the conclusion reached is that "operation, however, has no place in the treatment of Pott's disease until conservative measures have been faithfully tried for a sufficient period of time—measures which, in most cases, will prove efficient and successful in the relief of the paralysis."

Eighty pages are covered by lateral curvatures of the spine. The evil effects of this distortion are well portrayed. Gymnastics, having in view the development of the weakened muscles, form necessarily an important part of treatment, mechanical support being applied judiciously in severe cases.

Hip disease necessarily commands an important position in the book.

The article shows a most careful consideration of the methods of treatment, both by rest, fixation, and traction. The conclusion that it is difficult to summarize the treatment for this malady, for the reason that cases differ greatly in severity, is eminently wise. Too much importance is usually given to the absolute treatment of hip disease by a certain method, or by a certain form of splint, and these authors judiciously make a decided difference in the varied class of cases. In their work they use such methods as may be needed by the indications present. A case in the acute stage differs greatly from one that has passed into a chronic condition. As long as the hip is sensitive, the utmost care should be exercised to arrest the inflammation.

Tubercular articular osteitis of the knee also comes in for a chapter full of thoughtful suggestions. Fixation, protection, and rest are the essential conditions of treatment.

Various forms of club-foot, and a few of the innumerable varieties of apparatus, are discussed. Operative treatment receives its full share of attention, as without operation the correction of talipes is slow and tedious.

In congenital dislocation of the hip it is recommended, by long-continued rest and traction, followed by the use of apparatus, that an attempt be made to limit the mobility of the head of the femur.

Infantile spinal paralysis and cerebral paralysis in children very properly receive full consideration, as they are among the most disabling deformities; and we are glad to see that tenotomy is advised, not only for spinal paralysis, but also in cerebral palsy, when the limbs can be thereby placed in a better mechanical position for locomotion.

Rickets, and its results, especially knock-knee and bow-legs, are carefully treated. The use of apparatus is advised, not only as a preventive means, but as a corrective one. Operative interference is recommended in all the severer grades of cases.

Plastic surgery is only considered as regards the hands and feet.

In flat-foot only the severe grades are recommended for operation.

The chapter on the *Functional Affections of the Spine and Limbs* is a very suggestive one for neurologists, as well as for orthopædic surgeons, and the benefits of apparatus are well shown.

The eight hundred illustrations, as a rule, are good and well chosen, but the general appearance of type and paper is not as clear as it should have been. The material, however, is so good that the book will take its place at once as the recognized index of progressive American orthopædic surgery.

DE F. W.

THE STUDENTS' SURGERY. By FREDERICK JAMES GANT, F.R.C.S., Senior Surgeon to the Royal Free Hospital. Pp. xxxv., 817. Philadelphia: Lea Brothers & Co., 1890.

THE modest title, and, indeed, the preface of this excellent book, suggest the examination-room and the "quiz," but the work has a larger field. Condensed in form, with small type and meagre space for illustrations, within the more than eight hundred pages is contained a

very large amount of material, which is well arranged, though a good index would greatly add to its availability.

It is gratifying to find a book, intended solely for students, which really contains the essentials of surgery and is not so superficial or so condensed as to be of use only for "cramming," as are so many books of its class. This is an epitome of the author's *Science and Art of Surgery*, exclusive of the chapters on the eye, ear, teeth, skin, female genital organs, and upon orthopædics. It follows the order of arrangement of that well-known work; that one may supplement the other. Simple and straightforward in style, and conservative in tone, the book treats, briefly it may be, but fairly, each of the many phases of its subject. The experience of the writer tells on every page. He has passed the period of operative enthusiasm; with a wholesome regard for the *vis medicatrix naturæ*, operative measures are his last, and not his first resort.

As is the case with most general surgical works now published, the treatment advised is that which had stood the test of time up to ten or fifteen years ago, while the new surgery of to-day is not considered to have won a permanent place. That conservatism seems too great, however, which would justify laparotomy for hæmorrhage in wounds of the abdomen only when "a distinct jetting stream of blood" can be felt by the finger (p. 592).

The author agrees with those who practise venesection for internal hæmorrhage (p. 593). Opium is his sheet-anchor in traumatic peritonitis (p. 596). "Purgatives during the inflammatory stage are useless or injurious." No mention is made of flushing the peritoneum with water, either after fæcal extravasations or in peritonitis.

The preface is dated October, 1889, but parts of the work would appear to have been written some years ago. For instance, the description of the *technique* of antiseptics includes the spray, and refers almost solely to *carbolic acid* solutions. The antiseptic agents "commonly employed" are given as carbolic acid, boracic acid, chloride of zinc, etc., while corrosive sublimate is included among the "others" which "may be mentioned." The fact that the opinions expressed were formed before the reign of corrosive sublimate and well-understood asepsis, is seen also in the discussion of compound fractures and compound dislocations. The present book, though recently published, is really a condensation of the author's older treatise, as has been said.

There is some tendency among writers of the day to make antiseptics the whole of surgery, a mistake of which our author is not guilty. Some harm is done, however, by the publication of really old ideas in a professedly new form, by making the average practitioner, who does but little surgery, contented with results which, according to modern standards, are quite unwarranted.

A valuable chapter is that devoted to the subject of vesical calculus and allied disorders. An excellent description is given of lithotomy in its various forms, and of lithotripsy. Safer advice, more intelligent reasoning, or more accurate description could not be desired than is found in the chapters on hernia and intestinal obstruction. The author is not enthusiastic as to the result of the operation for the radical cure of hernia, but believes that it should be undertaken after strangulation, when circumstances permit.

As to the operation of election, he adopts the teaching of Mr. Mitchell

Banks, who writes: "An operation should be recommended (a) in children only when it is impossible to get the parents to pay any attention to the complaint—in short, in the children of the poor and ignorant; (b) in small femoral herniæ composed of irreducible omentum, always; (c) in inguinal herniæ incapable of support by reason of the presence of adherent omentum, always; (d) in all herniæ whose great size renders support by a truss impossible." The point in the operation Mr. Banks describes is the complete separation of the sac; the tying it off, if possible, at the level of the abdominal peritoneum; and, finally, cutting it away.

In regard to the treatment of fracture of the patella, the author says: "Considering the safety and efficacy of the old method, even when apparently resulting in failure, my own judgment decidedly inclines to the treatment of a simple fracture of the patella by bandage-retention of the fragments, in the manner already described; and I think that wiring, if practised at all, should be reserved for those quite exceptional cases in which the fracture remains ununited, as the final result."

The author is earnest in endorsing the time-honored view that simple depressed fractures of the skull should be left alone in the absence of symptoms of compression. "Surgeons," says he, "with unlimited faith in antiseptic precautions, but with limited experience in fractures of the skull, would operate as if the whole significance of head-injuries was the liability to septic infection—even allowing the assurance of its prevention in all cases."

The book is printed in London. It is impossible to avoid disappointment, in these advanced days of wood-engraving, upon finding again the old diagrammatic English style of cuts, which have for so many years served as illustrations. Their usefulness was never great, and the time has come, in America at least, when a much higher standard is expected. Such cuts, for instance, as those on pages 332, 486, 798, 800, 801 and 808, and those in the chapter on hernia, teach nothing, and should have been omitted.

G. E. S.

THE PULSE. By W. H. BROADBENT, M.D., Fellow of the Royal College of Physicians, Senior Physician to, and Lecturer on Clinical Medicine in the Medical School of, St. Mary's Hospital, etc. Illustrated with 59 Sphygmographic Tracings. Philadelphia: Lea Brothers & Co., 1890.

THIS little book is largely based on the Croonian Lectures on the Pulse, which were delivered by Dr. Broadbent before the Royal College of Physicians in 1887, and it probably represents the best practical thought on this subject in the English language. Its first chapter opens with a history of our knowledge of the pulse, and this is followed by chapters on the pulse, its production and significance; mode of feeling the pulse; the heart-sounds in relation to the pulse; increased frequency of the pulse; infrequent pulse; intermittent and irregular pulse; the pulse as influenced by variations in arterio-capillary resistance; high arterial tension; the pulse in acute disease, in cardiac valvular disease, in aneurism, in kidney disease, and in affections of the nervous system.

Whilst it is true that the graphic method bears a most intimate rela-

tion to pathological physiology, it is also true that when we endeavor to get a true interpretation of the pulse through the sphygmograph we fail to do it as accurately and as satisfactorily as when we apply the finger. The reason for this defect, which Dr. Broadbent fully recognizes, is not far to seek. The sphygmograph is an instrument which is only capable of registering the undulations of an artery—the rise and fall of a pulsating tube—together with the grosser modifications of these movements. But there is something more than a mere change of form in the pulse-wave which the sphygmograph cannot detect, and it is this defect which, in point of usefulness, will always place it far beneath the touch of the educated finger.

A correct interpretation of the pulse, with its almost infinite modifications brought about by almost unlimited bodily variations, can only be achieved by experience, and as an aid toward attaining this goal nothing will be of more service than this brochure on the study of the pulse.

T. J. M.

LEÇONS DU MARDI À LA SALPÊTRIÈRE. PROFESSOR CHARCOT, Policlinique, 1888-1889. Notes de Cours de MM. Blei, Charcot, Henri Colin, élèves du Service. Tome II. Paris, 1890.

TUESDAY LECTURES AT THE SALPÊTRIÈRE. By PROFESSOR CHARCOT.

THE book before us is a bulky volume of over 550 pages, and embraces a report of twenty-one clinical lectures. It is pleasant to note at once that no attempt has been made, as in a previous publication, at a *fac simile* reproduction of the notes in script, but that the book is printed in clear, bold type. A great variety of subjects have been dealt with, though hysterical disorders largely predominate. The book is full of most interesting material, some of which is new; however, we cannot but regret that the reports were not limited to abstracts and excerpts of the more important matter. In the overburdened condition of medical literature and the great pressure on the time of professional men, it is hardly possible to read long verbatim reports of clinical lectures, in which even the conversations between the patient and the lecturer are repeated with absolute detail and painful accuracy. However, as a mere clinical record, the book is beyond praise.

To give the reader some idea of the subject-matter let us take the *première leçon*. Two cases of hysterical yawning, one spontaneous and the other suggested, are first considered. Tracings of the breathing are exhibited, the previous histories and their significance dwelt upon, and the concomitance of other hysterical signs, such as hemianæsthesia, convulsive attacks, etc., pointed out. The third case, one of hysterical rapid breathing, is similarly dealt with. The fourth, and last case of the lecture, is very interesting. It is one of *grand tic convulsif*, in which the tic was associated with coprolalic and psychic disorders. The patient was a man, aged thirty-nine years, who was afflicted with a convulsive movement in which the forearm was suddenly flexed upon the arm followed by a brusque movement of the shoulder. The elbow was then raised to the right side of the face, the head being simultaneously inclined

to the same side. The entire attitude was one of defence, like that of a school-boy about to receive a box on the ears. The tic was so violent and persistent that the patient's wife was in the habit of tying his hands at night to diminish the movements which would otherwise prevent sleep. The attacks came on with the suddenness of electric shocks, and in no way did they resemble the movements in the chorea of Sydenham. With every seizure the patient ejaculated "Ah! Ah!" which the lecturer interpreted as representing, in some sort, the oaths and foul phrases so often observed in other cases. In addition, the patient suffered from psychic disturbance, as illustrated as follows: The patient stated that after writing a letter he would seal and address it, and then go to the post. But when about to place it in the box, he would hesitate, retire four or five times from the opening before finally dropping it, and when the act was at last accomplished he would experience profound emotion. The sight of a razor would fill him with trembling and fear. He had the idea that he would kill some one or kill himself. The sight of a gun, or, in fact, the mere conception of a gun excited the same feeling, and, up to a certain point, he really had the desire to kill some one. Frequently the mere sight of a cabman excited the desire to beat him. Finally, the patient attributed his disorder to the fact that his mother while with child with him had served in the family of a banker who had been afflicted by a frightful tic. This interpretation, however, it is needless to say, was not accepted by the lecturer. The feasibility of exploratory trephining naturally occurs to the reader, but no allusion is made to it. Certainly, in a case the movements of which are so fixed and definite, and in which there can be no doubt about the cortical character of the trouble, the idea of trephining is worthy of consideration.

The other lectures are filled with like interesting material. Much that is unusual and bizarre is presented. A suggestive case, for instance, is that presented in Lecture II., in which a traumatic neuræsthenia and hysteria with hemianæsthesia were imposed upon an old case of sciatica with deformity. The importance and significance of the family history become evident when we are informed that an uncle of the patient was insane, that his mother and father both died of tuberculosis, and that a brother and cousin were epileptic.

A case deserving especial mention is that embodied in Lecture III., of poisoning by carbon disulphide. The patient was a man, sixty-three years of age. He had worked from time to time in the factory when the sulphide was made, at other times he had worked at his trade as mason. For the last four months, however, he had worked steadily at the factory, and one day, while cleaning a vat intended for the sulphide, he met with the following experience:

"It does not seem to be at all rare," says the lecturer, "for accidents of this kind to occur while cleaning these receptacles. This is what happened: all of a sudden, P. (the patient), after having had a feeling of suffocation and a sensation of heat in the scrotum, fell to the ground, without giving vent to the least cry, as though struck by an apoplexy. His companions thought that he was suffocated. They say that during the time that he was unconscious, a period of about half an hour, there were no convulsions. Finally, he came to, and they put him on his feet again very much confused and astonished. He remained in his room for two days, and during this time did not notice especially what was

happening, but on the third day he noticed marked stiffness of the right arm, and on the day following, on awakening he found the limb almost completely paralyzed. On the same day the right leg became affected in the same way, but to a much less extent, for the patient has still been able to walk rather well." The hemiplegia was now of six weeks' duration. In walking the right leg was dragged, the foot now leaving the ground. The arm hung loosely, was not rigid, and was very weak, while the fingers were stiffly extended at right angles to the palm. The last was due to a spasmodic contracture, there being an elastic resistance either to flexion or extension. The mere fact of the position of the fingers not corresponding to the contracture of old organic hemiplegia was enough, the lecturer pointed out, to attract the attention of the connoisseur. Further, there was no exaltation of the reflexes, another anomalous fact. Again, examination disclosed that the cutaneous sensibility of the paralyzed parts was profoundly affected. A profound anæsthesia was found to involve, not only the paralyzed parts, but also one-half of the trunk. A diagnosis of hysteria was made, and the patient's condition compared to that which sometimes results from traumatism, saturnism, alcoholism, etc.

The above extracts will give the reader some idea of these interesting clinics, and would foreshadow the experience of a visit to the Salpêtrière. As already stated, functional diseases and hysteria largely preponderate, though interesting organic cases are not wanting, as witness a case of crossed hemiparaplegia due to lesion of the cord in its lateral half, a result of trauma, and a case of syringomyelia, which is made doubly attractive by being coupled with a case in which hysteria closely emulated the organic disease.

F. X. D.

INTERNATIONALER ATLAS SELTENER HAUTKRANKHEITEN. INTERNATIONAL ATLAS OF RARE SKIN DISEASES. ATLAS INTERNATIONAL DES MALADIES RARES DE LA PEAU. Herausgeber-Editors-Editeurs: MALCOLM MORRIS, London; P. G. UNNA, Hamburg; H. LELOIR, Lille; LOUIS A. DUHRING, Philadelphia; L. VOSS, Hamburg. Leipzig: II. (1889, II.)

THIS last issued fasciculus of the *International Atlas of Rare Skin Diseases* is in point of merit quite equal to its predecessor, which has already received a favorable notice in these pages.

The first of the four papers here selected for illustration is by Ernst Schwimmerand, and accompanied by an admirable portrait in colors of a male patient affected with multiple diffuse pigmented sarcoma of the skin. The diagnosis rests upon a careful microscopical examination made of sections of tumors removed from near the brow.

The paper, apart from its intrinsic value, is of interest as establishing further proof of the wide distinction between mycosis fungoides (once thought to be a species of cutaneous sarcoma) and this last-named disease in its several manifestations in the skin. Mycosis fungoides has to-day a scarcely disputed position among the infectious granulomata, and its clinical symptoms are now classically as separate from those of sarcoma as are syphilis and lepra, which the author systematically ex-

cludes from the diagnostic possibilities. It is interesting to note, by the way, that Hardaway, cited by our author among the American contributors to his theme, has lately¹ made a supplemental report of his case of idiopathic pigmented sarcoma, originally described some fifteen or sixteen years ago, in which it is shown that the patient is now in good health, that the active sarcomatous process is apparently at an end, and that the growths are undergoing spontaneous involution, leaving atrophic patches where there were once tumors. The fact is of special interest in this connection, seeing that the strongest resemblance exists between the portraits of the two patients as furnished by the two authors in different hemispheres.

The second of the illustrations in this fasciculus of the *International Atlas* represents the palm of the right hand of a male patient affected with symmetrical erythematous keratoderma, observed some seventeen years ago by Besnier, and then reproduced in one of the fine *moulages* of Baretta. The hyperkeratotic plaques with their reddened rims are well shown in the colors peculiar to each. It is to be regretted that the author did not make it clear in his description whether there was in this case an active or passive hyperæmia of the borders of the patches, and also that he did not state whether there was or was not a coincident hyperidrosis of the hands and feet, and irregularity of the cardiac movements. The later studies of these curious trophoneuroses of the extremities with cutaneous manifestations, make it clear that the redness is often in pure type a passive hyperemia, and accompanied by profuse diaphoresis, usually limited to the hands and feet. Spontaneous relief of some of these conditions has occurred without the intervention of treatment.

Upon the same sheet with Besnier's case is represented the hand of a young girl under Mibelli's observation, the dorsal surface of the digits chiefly being the seat of multiple verrucous lesions of a dark purplish-red shade. These, microscopically, were discovered to be epithelial growths with a more or less centrally situated cavernous channel of vascular connections, suggesting to the author the name which he has given to the lesions—to wit, angiokeratoma. They are, undoubtedly, very rare, and might be described as warty growths of a blood-vascular type.

Pospelow's case of "*ulcus molle mammæ*" is the theme of the last paper, and illustrated fully by a life-sized colored lithograph. The ulcer represented might, however, serve as an example of the initial lesion of syphilis upon the nipple, so far as relates to its external appearances. Indeed, attempting to exclude such a possibility by comparing the history of the sore with its portrayed symptoms, one is at once persuaded that it falls into that category of mixed and doubtful cases furnished in every large public, and especially hospital, practice. The author himself seems not to be clear as to all the facts, since he ordered for the patient a mercurial course in consequence of the development later of some suspicious pharyngeal symptoms. On the whole, one would hesitate before citing this as a good example of the exceedingly rare soft chancre of the nipple, whose actual rarity and the cloud that hangs over its few reported cases, lead one to regard with an increasing suspicion the proofs of its existence.

The pages of this fasciculus, albeit they are printed in three languages, betray only a very few lingual errors and typographical faults, so few, in fact, that they may well be overlooked in the results actually

¹ Report to the American Dermatological Association, September 19, 1899.

obtained, after unusual effort, to produce a page for international perusal. The work is highly to be commended, though its usefulness is rather to the expert than to the general practitioner. J. N. H.

THE SUPPRESSION OF CONSUMPTION. By G. W. HAMBLETON, M.D., President of the Polytechnic Physical Development Society of Great Britain. Pp. 37. New York: N. D. C. Hodges, 1890.

THIS brochure, one of the series of *Fact and Theory Papers*, may be regarded as a valuable contribution to preventive medicine. Its author, after giving his reasons for rejecting the prevailing theories of the causation of pulmonary consumption, states that he believes it to be exclusively produced by conditions that tend to reduce the breathing capacity of the lungs, and hence he very strongly advocates pulmonary gymnastics for the purpose of developing the capacity of the respiratory organs, not only as a preventive, but also as a curative, measure in this disease.

It is very obvious that, so far as it goes, Dr. Hambleton's theory abounds with truth, but it is equally evident that it fails to go far enough. If it is true that consumption is solely caused by a reduction of breathing capacity, why is it that the female is a great deal less liable to consumption than the male sex, in spite of the fact that the former has a smaller breathing surface than the latter?

Notwithstanding these and other objections which may be raised against Dr. Hambleton's etiological views, it must be conceded that his mode of suppressing consumption, by enhancing the vital chest capacity, is one of the most efficacious adjuvants in the prevention and treatment of consumption. M.

A NEW MEDICAL DICTIONARY, BASED ON RECENT MEDICAL LITERATURE. By GEORGE M. GOULD, B.A., M.D., Ophthalmic Surgeon to the Philadelphia Hospital; and Clinical Chief, Ophthalmological Department, German Hospital. Philadelphia: P. Blakiston, Son & Co., 1890.

ANYONE who has had occasion during the last eight or ten years to consult a medical dictionary, and who among the readers of recent medical literature but has frequently been obliged to do so, must have been struck with the large number of words which were not contained within its pages. The development of the science of medicine within the last decade, the advances made in microscopy, micro-chemistry, bacteriology and pathology, pharmacology and materia medica, electrotherapeutics and antiseptic surgery, have introduced new terms, which are in constant use, and for the meaning of which the reader has frequently to consult his Greek lexicon and search for the roots from which they are formed.

A new dictionary of medical terms, therefore, was much to be desired, and the present book by Dr. Gould is intended to supply this want.

The author has aimed at giving as much information in as small a space as possible, and has thus made some of his definitions rather too brief—e. g., under the heading "Cæsarean Operation" we find "Säuger's operation, *gastro-hysterotomy*, Säuger having greatly improved the

technique of the operation." "Thomas's operation consists in certain improvements in *gastro-clytrotomy*." As the main features of Kehrer's, Porro's, Sigault's, and the Porro-Müller operations are described in a few words in the same article, we think that a brief description of the essential points of the former operations would have also been in place. We have met with several other instances where the author has, perhaps, been rather sparing of words, but as this is a tendency rarely found among writers of the present day, perhaps it is to be commended rather than condemned. One pleasing feature of the book is that the reader can almost invariably find the definition under the word he looks for, without being referred from one place to another, as is too commonly the case in medical dictionaries. The tables of the bacilli, micrococci, leucomaines, and ptomaines are excellent and contain a large amount of information in a limited space. The anatomical tables are also concise and clear.

We would suggest to the author that, in his next edition, when he makes use of a Greek word, he might insert the accent as is usually customary. A typographical error, which, however, is of little importance, occurs in the excellent appendix on the "Mineral Springs of the United States," by Dr. Judson Daland, of Philadelphia. On page 501 "Fauquier White Sulphur Springs" are said to be in "Fauquier County, Virginia," while on page 479 the same springs are placed in "West Virginia." The former is correct. We would unhesitatingly recommend this dictionary to our readers, feeling sure that it will prove of much value to them.

H. M.

HOW TO EXAMINE FOR LIFE INSURANCE. By JOHN M. KEATING, M.D.,
President of the Association of Life Insurance Medical Directors, etc.
Philadelphia: 1890.

THIS unpretentious volume, from the pen of one of our most experienced and conservative life insurance medical directors, is just such a book as the young and inexperienced medical examiner needs. It is not a manual of medical diagnosis, though founded upon the best works of that description. It contains those suggestive hints and recommendations that will be useful to the medical beginner and that can only be furnished by the man of experience.

After an introduction of four chapters filled with advice about "how to examine for life insurance," there are eleven chapters devoted to the special investigation of the different organs of the body as they should be passed in review by the examiner.

The work is not encumbered with detail; only so much has been admitted as may be necessary to fix attention upon essential things. The author has, however, included a description of several of the newer pieces of apparatus that are useful in diagnosis, such as the very convenient ureameter and the saccharometer which are now furnished to the profession. Convenient tables, for reference regarding various physical conditions that admit of tabular statement, have been introduced; and a very useful appendix contains the full text of the "Instructions to Medical Examiners" that have been issued by the principal life insurance companies of this country.

H. M. L.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

FORMULÆ FOR DYSPEPSIA.

HUCHARD publishes, in *Les Nouveaux Remèdes*, April 8, 1890, several formulæ which are claimed to be of value in the treatment of dyspepsia, especially with a view of preventing the development of flatulence. Among the remedies which the author has found most satisfactory, chloroform is the best. On account of its irritant action, it should not be given in a state of purity or in capsules, as is so frequently done, but as chloroform-water.

Saturated chloroform-water	150 parts.
Distilled water	120 "
Mint-water	30 "

Of this mixture a tablespoonful may be taken either immediately before or during a meal.

When it is desired to employ the so-called absorbing powders, the following may be prescribed:

Powdered charcoal	5ij.
Sodium bicarbonate	5jss.
Calcined magnesia	5j.
Powdered columbo	5ss.

Make forty powders. One powder may be taken half an hour or an hour before eating. If an antiseptic action is desired, at the time of eating:

Beta-naphthol	}	5â gr. xlv.
Salicylate of bismuth		
Magnesia		

Make thirty powders, which may be administered as above.

MENTHOL IN THE HYPEREMESIS OF PREGNANCY.

This is in some cases a grave complication of pregnancy. Copeman's treatment, dilatation of the os and cervix uteri, does not suit every case. DR. GOTTSCHALK recently described a case where, in a woman aged twenty-six, who had been pregnant three times, uncontrollable vomiting set in during the second month of her fourth pregnancy. Neither cocaine nor Copeman's treatment availed, and the sickness continued until abortion was induced. The patient became pregnant for the fifth time, and the vomiting returned, hæmatemesis taking place. A draught consisting of menthol 1 part, rectified spirits 20 parts, and distilled water 150 parts, was prescribed, and a tablespoonful given every hour. The vomiting ceased after the third dose, and pregnancy proceeded to term without any further complication. A second case was also successfully treated with menthol.—*British Medical Journal*, June 14, 1890.

PILOCARPIN IN DRYNESS OF THE TONGUE.

Extreme dryness of the tongue is, under some circumstances, a very distressing symptom, and one which does not readily yield to treatment whilst the concomitant cause remains in operation. The sucking of ice, or sipping of bland fluids gives but temporary and inadequate relief, and the same may be said of glycerin employed as a paint.

In this condition DR. BLACKMAN has used successfully one-twentieth of a grain of pilocarpin in the form of a gelatin lamel allowed to dissolve on the tongue previously moistened by a sip of water. This dose quickly establishes a moderate flow of saliva, which persists for at least twenty-four hours, and is unaccompanied by excessive perspiration. The altered state of the mouth is often described by the patient as being delightful.

It is scarcely necessary to add that due caution ought to be exercised in the use of so potent a remedy.—*British Medical Journal*, June 14, 1890.

CHLORODYNE POISONING THROUGH THE MOTHER'S MILK.

A case is reported in the *Australasian Medical Gazette* recently, of a woman who had given birth to twins, and was suckling them both. One evening she took a dose of chlorodyne for the relief of pain, and soon after taking the drug suckled the infants. The children were found the following morning profoundly narcotized, and died before evening.

EXCRETION OF BALSAMS IN THE URINE.

The use which is now being made of balsam of Peru in the treatment of tubercular disease has aroused considerable interest in the question as to whether it is apt to produce nephritis during its excretion by the kidneys. DR. RALPH STOCKMAN has made a number of observations on it and other balsams with the view of determining this. The observations were carried out on two medical men and upon rabbits, and were limited to the four balsams in the *British Pharmacopœia*, namely, balsam of Peru, balsam of tolu, prepared storax, and benzoin. The result of these observations seems to

show that all these balsams can be given in as large a dose as is ever desired in practice, without any risk of producing albuminuria or nephritis. The amount of irritation which they cause is never sufficient to injure the healthy kidney, although it may irritate seriously one which is already diseased. In some, at least, of the recorded cases of albuminuria, after the administration of balsams, a resinous body in the urine has been mistaken for albumin.—*British Medical Journal*, June 14, 1890.

ACUTE ŒDEMA GLOTTIDIS AFTER POTASSIUM IODIDE.

Cases of this nature are few in number, and the one reported by DR. GROENOUW is of practical interest. A strong, healthy man, forty-three years of age, suffering from optic atrophy, and with the urine quite free from albumin and sugar, was treated with iodide of potassium, in the form of a watery solution, in doses of seven to fifteen grains thrice daily. On the afternoon of the second day, when he had taken about forty grains of the salt, he complained of a feeling of rawness in the throat; by the evening of the fourth day there was hoarseness, with pain on swallowing, localized in the right side of the larynx. These symptoms, which were not by any means prominent, were not more pronounced on the evening of the sixth day, after the use of a little over three drachms of iodide. The same night, after two hours' quiet sleep, the patient awoke, began to cough, and noticed suddenly that although the expiration was free, the inspiration was difficult, and he felt as if a valve were in the throat. The difficulty lessened in the space of two hours, and he slept again, the dyspnœa having quite disappeared by next morning. In the afternoon, on examination, the right ventricular band was œdematous, as also the mucous membrane over the arytenoid cartilage and the ary-epiglottic ligament. After an intermission of two days the iodide was resumed; and although the dose was a full one, no further symptoms of iodism appeared. In spite of the severity of the attack tolerance was established. The iodide of potassium given was exactly the same as other patients were using, and it is not likely that the symptoms were due to impurity of the drug.

Groenouw observed a similar case two years ago in a woman of sixty-six, who was the subject of moderately enlarged thyroid, but without difficulty of breathing, and was suffering from oculo-motor palsy of one eye, for which iodide of potassium was prescribed in small doses. After seven grains, severe coryza and conjunctivitis, with great dyspnœa and loss of voice, came on. Examination showed marked pharyngeal catarrh and evident swelling and redness of the ventricular bands. Three days later, when the symptoms had subsided, four grains were given daily for three days; but on being increased to twice daily there appeared—more or less every time—hoarseness, difficulty of swallowing, and pain in the head. The drug was accordingly stopped for four days, and then the patient took about four grains daily, diluted with much water, the dose being gradually increased in the course of the next two weeks to fifteen grains a day. On attaining this amount, it had to be reduced on account of pain in the throat and general restlessness; and seven days later it was discontinued altogether.

Groenouw thinks the following conclusions may be drawn: After the administration of iodide of potassium, there occurs in certain rare cases great

dyspnœa due to œdema of the glottis; sometimes so extreme as to demand rapid tracheotomy. It does not arise from long use or large doses—relatively small amounts have hitherto induced it; and other symptoms of iodism, such as headache, are wanting. The action is local upon the larynx—not a part of a general œdema. Its cause is certainly the iodine, not the potassium, and it cannot be ascribed to any impurity. No local or general diseased state—for instance, cardiac or renal disease—can be recognized; and the cause must be looked for rather in an idiosyncrasy of the individual, although even this is not by any means absolute, as a complete tolerance may be established after a few days' pause.—*Practitioner*, June, 1890.

BROMOFORM IN PERTUSSIS.

STEPP reported a hundred cases of whooping-cough in which bromoform was used with success (*Deutsche med. Wochenschrift*, 1889, Nos. 31, 44), and recently DR. NEUMANN has treated sixty-one cases with this drug, or with antipyrin, phenacetin, quinine, resorcin, or benzoin (insufflations). Fifteen of the patients were less than a year old, and a number of the cases were severe in character though there were few serious complications. Bromoform is conveniently administered suspended in sweetened water, half a drop to a drop every two hours to a child two years old.

The intensity and the number of attacks in the twenty-four hours is diminished. The duration of the disease is not shortened, according to Dr. Neumann, though Stepp is of the opinion that this is also a result of its action.

It is harmless, not difficult to administer, and is worthy of a trial, though it is no more a specific than are quinine and antipyrin.—*Therapeutische Monatshefte*, July, 1890.

DR. LÖWENTHAL, after testing the drug in more than one hundred cases, is more enthusiastic about its results than some others.

It is important to use a preparation which is perfectly clean and has not become discolored through decomposition by exposure to the light.

Children up to one year of age may have 2 to 4 drops three times a day, from two to four years 3 to 4 drops three or four times a day. Up to eight years 4 or 5 drops three or four times a day, according to the number and intensity of the attacks.

The good effects of the drug were apparent sometimes on the second or on the third or fourth day. The course of the disease is shortened, the children being relieved in from two to four weeks. The appetite is improved; in simple cases languor and drowsiness were noticed after each administration of the bromoform. In one case—a weakly child fifteen months old—where too large a dose had probably been given, narcosis ensued. Recovery followed the subcutaneous injection of ether, and camphor administered in powder.

Dr. Löwenthal believes bromoform to be more favorable than any other treatment of pertussis.—*Therapeutische Monatshefte*, July, 1890.

REPORT OF HYDERABAD CHLOROFORM COMMISSION.

In the *Lancet* for June 21, 1890, a considerable number of tracings made by the Commission are reproduced, together with the conclusions drawn from

them by Surgeon-Major Lawrie. Chloroform, when given continuously by any means which ensures its free dilution with air, causes a gradual fall in the mean blood pressure, provided the animal's respiration is not impeded in any way, and it continues to breathe quietly without struggling or involuntary holding of the breath. As this fall continues, the animal first becomes insensible, then the respiration gradually ceases, and lastly the heart stops beating.

If the chloroform is less diluted the fall is more rapid, but it is always gradual so long as the other conditions are maintained; and, however concentrated the chloroform may be, it never causes sudden death from stoppage of the heart. So far as experiments on animals go, chloroform has no power of increasing the tendency to either shock or syncope during operations.

The Commission found, however, that struggling during chloroform inhalation, or anything which interfered with the breathing in any way, such as holding the breath or asphyxia, produced irregularities in the circulation and in the action of the heart. Even such slight interference as is brought about by forcibly pulling the tongue forward had this effect. In fact, pulling the tongue was the only proceeding, short of direct irritation of the vagus, that appeared to produce shock. Inhibition of the heart's action and slowing of the circulation, with rapid fall of pressure, caused by irritation of the vagus, proved to be a safeguard rather than a danger.

The Commission found that an effect precisely similar to that caused by electrical stimulation of the vagus is produced through the same nerve—(a) in holding the breath, which occurs in the early stages of chloroform administration; (b) in asphyxia; (c) sometimes after the respiratory centre is paralyzed in the later stages of chloroform poisoning.

The experiments of the Commission proved that death from chloroform is invariably due to an overdose; and the question which next arose was, Are there any circumstances which make chloroform inhalation dangerous, and, as it were, open the door to an overdose, or make the action of the drug appear capricious?

It is fully demonstrated by the experiments of the Commission that struggling, holding the breath, any form of asphyxia, or any kind of interference with the breathing are dangerous in chloroform administration. Obviously either complete asphyxia or continuous holding of the breath, if this were possible, would be sure preventatives of poisoning by chloroform; but the danger in such conditions is due to the fact that they must alternate with extra-vigorous and deep respiration. Struggling makes the inhalation of chloroform dangerous, because it either partially asphyxiates the patient, or alternately does this and accelerates the respiration and circulation, so increasing the amount of chloroform inhaled and hastening the rapidity with which the chloroform is conveyed to the brain and nerve centres. Holding the breath causes asphyxia, and asphyxia produced in this or in any other manner poisons and stimulates the respiratory centre, and, on the one hand, makes it extremely obnoxious to paralysis by chloroform; while, on the other, it leads to gasping and deep inspirations, by which an overdose is very soon taken in. The rapidity of chloroform poisoning when asphyxia is produced is much the same as it would be if you threw a man into a pond, and held a chloroform inhaler over his head every time he came to the surface to

take a breath. This is exactly what a timid or badly-taught operator often does. He measures his chloroform and pours it into a patent inhaler, which he then applies to the patient's face. The patient holds his breath and becomes deadly pale, while his vagus slows the heart and circulation. Presently the patient takes a deep gasp, and as soon as the chest begins to move, the chloroformist thinks there is no danger and replaces the inhaler on his face, probably adding another dose of chloroform as he does so. The patient's natural protective means being exhausted, he very quickly absorbs a fatal dose of chloroform, and we are subsequently told that his heart failed, that he afterwards gasped two or three times and then died. No care in measuring the chloroform or diluting it in a mechanical inhaler is any guide whatever to the amount of the anæsthetic a patient inhales or absorbs. Moreover, *breathing through an inhaler is not natural breathing.*

The Commission has shown that the key to the safe administration of chloroform is that the breathing be natural, so as to avoid struggling and any form of respiratory embarrassment; and, that it may be so, the anæsthetic must be administered in an open cone or cap, which is held far enough from the patient's face to avoid causing him to hold his breath or struggle, and into which he is at first made to blow after each inspiration, the cap being brought nearer to the face, and eventually quite close to it, as the chloroform begins to take effect and he breathes regularly.

Though fall of pressure is inseparable from chloroform administration, there is never the least danger if it falls regularly, and if the inhalation is stopped directly the state of the cornea shows that the patient is "under." Regularity of the blood pressure depends entirely upon regularity of the respiration. Any irregularity, therefore, in the fall of blood pressure during chloroform inhalation indicates irregularity of or interference with the respiration; and, *per contra*, any irregularity of or interference with the respiration at once causes irregularity in the fall of the blood pressure; but as long as the respiration is regular and not interfered with, the fall of the blood pressure will exactly correspond with it, and will cease long before a dangerous point is reached *if the inhalation is stopped when the cornea becomes insensitive*, or other signs show that the patient is "under." If the respiration is kept up without struggling, holding the breath, or asphyxia, chloroform may be given slowly or quickly, freely and with perfect confidence, without the slightest risk to the patient.

The Commission has demonstrated that the aim of the surgeon must be to give chloroform so that the blood pressure should fall regularly throughout the whole administration, and that the blood pressure can only be kept free from irregularities by absolute regularity of the breathing. The chloroform must, therefore, be inhaled in such a way that the breathing is natural and regular throughout. Feeling the pulse during chloroform inhalation is no guide whatever either to the blood pressure or to the one thing necessary for safety, which is, to keep it regular; and it has been shown above that the pulse is of no value as a sign of approaching danger, since it is only affected dangerously—(a) when the respiration has been interfered with, or (b) by an overdose. Lastly, in order to keep the breathing regular, the whole of the administrator's attention must be concentrated upon this point alone; and it is therefore clear, that if, as is now recommended in most of the text-books,

part of the chloroformist's attention is to be given to the pulse, an important element of danger comes into the administration.

We can no longer contend, with regard to chloroform, that the results or clinical experience and of experimental research do not agree. The investigations of the Hyderabad Commission have brought to light a strikingly precise and complete agreement between both. In the *Lancet* of April 5, 1890, there is given a continuous series amounting to more than 45,000 cases or almost daily (and often several times a day) chloroform administration, extending from 1847 to 1890, in which the respiration alone was taken as a guide, without one death resulting. We thus see that in a long series or 45,000 cases, extending over forty years, in which the chloroformist's attention was concentrated on the respiration alone, and in which the chloroformists were students, there were no deaths at all; while in another series of 12,368 cases, in which a part of the chloroformist's attention was devoted to the pulse, and in which the chloroformists were specialists (anæsthetists) there were no less than 10 deaths—a fraction over one in every 1250 administrations. These clinical results correspond with the conclusions arrived at by the Hyderabad Commission, and are sufficient to show what a tremendous difference to the patient the mere method of administration may make.

The committee of the British Medical Association on anæsthetics do not agree to all of the conclusions of the Hyderabad Commission (*Lancet*, June 14, 1890). They also found that animals died under chloroform, when its administration was pushed, through paralysis of respiration; and though the heart continued to beat after cessation of respiration, the heart was to some extent simultaneously affected, and there were cases in which the heart appeared to fail at least as soon as, if not before, the breathing. The committee hold that it is quite possible for chloroform to kill by paralyzing the heart. Experiments were made upon rabbits and dogs, where the heart was exposed to view, and any desired vapor could be breathed into the lungs by artificial respiration. When chloroform was administered in this way, there is at once a most serious effect upon the heart; the right ventricle almost immediately begins to distend, the heart presently stops, while the right ventricle is engorged with blood. The contrast is striking when ether is used instead of chloroform, the conditions of the experiment being the same in the two cases. Ether may be given for an indefinite period without interfering with the heart. Unquestionably there may be sudden falls in the blood pressure during chloroform narcosis due to interference with the heart's action.

In practice it makes little difference whether the heart stops before or just after respiration, as those cases in which cardiac and respiratory arrest are almost simultaneous are, for the purposes of the clinician, the same as those in which heart-arrest precedes respiratory paralysis.

The committee think it unwise on the part of the Hyderabad Commission to convey to the public, even through the profession, the notion that the administration of chloroform is a proceeding in which there is practically no danger.

MEDICINE.

UNDER THE CHARGE OF

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A CASE OF ADDISON'S DISEASE WITHOUT PIGMENTATION.

H. E. COUNSELL (*Lancet*, 1890, i. 960) reports a case of Addison's disease in a man aged twenty-seven years, of good family history, formerly intemperate, and impotent for two years. He suffered at first with symptoms of gastric indigestion, later growing worse, and attended by feelings of depression. There was progressive loss of weight and strength, shortness of breath, a slight yellow tinge of the skin, vomiting, pain and tenderness in the abdomen, rapid and feeble pulse, dizziness on sitting up, and diminution of the hepatic dulness. Still later the mind became cloudy; vomiting of a blackish material was almost constant, collapse developed, and the patient died. At no time was there any bronzing of the skin.

At the autopsy, one of the supra-renal capsules (the other was probably of the same nature, though this is not directly stated) weighed one and a half drachms, was larger than normal, with bossy surface, and contained in its substance large white deposits, varying in size from that of a pea to that of a cobnut. These masses were almost entirely caseous and did not stain well. No tubercle bacilli could be found in them, though the writer considers them undoubtedly of a tubercular nature.

CONTRIBUTION TO THE PATHOLOGICAL ANATOMY OF CHOREA; WITH THE REPORT OF A CASE.

DANA (*Brain*, 1890, Spring Number, 71) reports a case of chorea in a youth of eighteen years, who had suffered from the affection for twelve years. He had also had occasional epileptic attacks for several years. He lay in bed unable to walk or help himself on account of the violence of the choreic movements. His expression was dull, and his speech slow and jerky on account of the movements of the lips and tongue. Under the influence of treatment the choreic movements and the hysteroid or epileptic attacks diminished, but the patient died of pneumonia in less than a month after coming under observation.

The autopsy showed nothing of importance wrong on macroscopic examination. Microscopic study, however, revealed a non-adhesive leptomeningitis of the brain, with diffuse and varicose dilatations of the small arteries, especially of the deeper sub-cortical matter and capsule. There were degenerative changes in the arterial walls, and great dilatation of the perivascular spaces. The cortical cells were in most regions normal. The severest changes, vascular, interstitial, and degenerative, were in the under surface of the temporal

lobes, the internal capsule, and adjacent parts of the corpus striatum (especially lenticular nucleus and optic thalamus, antero-internal part). Varicose nerve fibres were here noticed. In the pons and medulla the same condition was observed, though less marked. There was cell degeneration in some of the cranial nerve nuclei, and slight connective tissue increase in the pyramidal tracts.

In the spinal cord there was slight leptomeningitis and congestion of the cord, especially in the lateral tracts. There was also a double central canal in certain portions.

The author has made a careful study of the literature of the subject, and has examined the post-mortem records in over eighty cases; but a critical analysis showed him that there are only thirty-nine of these available for study, as the others were either not instances of subacute or chronic chorea, or no satisfactory account of the lesions of the nervous system is given, or other reasons necessitated their exclusion from the tabulated arrangement which the article contains.

A review of these cases shows that in subacute chorea there is hyperæmia of the brain and parts of the cord. In the brain this is not meningeal but subcortical and basal. The arterial walls are paralyzed, dilated, and badly nourished; exudations occur, and the lymph-spaces become distended and eroded. There are stasis, thrombosis, spots of softening, minute hemorrhages. The lymph-spaces around the ganglion cells are not dilated.

In chronic cases the vascular and neuro-degenerative changes are more marked. The small arteries are permanently dilated, thickened, and degenerated, and the perivascular channels eroded and distended. There is also some connective tissue proliferation, and signs of degeneration in the ganglionic cells. The nerve-fibres show a varicosity. Hyaline bodies are seen. The process is, in fine, first a vaso-motor paralysis and trophic disturbance affecting certain areas of the brain, and, to a less extent, of the cord. Then we have this becoming chronic, with connective tissue hyperplasia, and degenerative changes in ganglionic cells and fibres. The disease cannot be localized in any one spot. It is rather a disease of the intracranial motor tract, including its starting-point in the cortex, and especially in its coördinating adjuncts, the lenticular nucleus and thalamus.

A CASE OF RAYNAUD'S DISEASE WITHOUT HÆMOGLOBINURIA.

COLMAN and TAYLOR (*Lancet*, 1890, i. 93, 967) reported a case in a girl, the disease reaching only the ischæmic stage, and affecting usually the two distal segments of the fingers of the right hand. There was a history of a similar condition having affected the maternal grandfather and a great uncle. The attacks were not preceded by any premonitory symptom; the middle finger suddenly became blanched, and the affection then spread rapidly to the other fingers. The thumb was rarely involved. The left hand usually escaped, but when attacked the spasm in both hands was symmetrical. During three of these attacks changes in the blood were observed; viz., crenation and breaking down of the red blood-cells, and coloration of the liquor sanguinis. There was never any pain as the attacks passed off. They were worse in cold weather, but putting the hand in hot water would provoke an

attack just as surely as placing it in ice-water. No hæmoglobin was ever detected in the urine, and it is probable that the small amount set free was excreted by the liver.

STUDIES ON THE BACTERIAL POISONS.

BRIEGER and FRÄNKEL (*Centralbl. f. d. med. Wissensch.*, 1890, No. 20, 366) have repeated and confirmed the investigations of Roux and Yersin on the poisonous metabolic products of Löffler's diphtheria bacillus. They report the results of their studies on twenty-two cases of pharyngeal and laryngeal diphtheria. From the cultures of the bacilli in peptone-bouillon they obtained an amorphous mass which gave the reactions of an albuminous body approximating to serum albumin. In addition it responded to such reactions as Millon's and the biuret. It was found to be very poisonous, $2\frac{1}{2}$ milligrammes per kilogramme of the body-weight being sufficient to kill, though sometimes only after several weeks. It produced the same symptoms as are seen after inoculation with the living microbes; such as acute inflammation of the kidneys, fatty degeneration of the liver, inflammatory œdema of the part surrounding the point of infection, and, especially, paralysis, particularly of the posterior extremities. The authors were unable to produce pseudo-membrane with the poison, and are therefore inclined to regard this as the specific result of the growth of the bacilli.

They found also a second albuminoid in the diphtheria cultures, closely allied to the first in its chemical properties, but entirely free from poisonous qualities. Only traces of it were found in the virulent cultures, but as the virulence diminished the amount of this albuminoid increased, until it finally replaced the first in the entirely inactive cultures.

In cultures of typhoid and of tetanus bacilli, of cholera bacteria, and of the staphylococcus aureus, as well as in the internal organs of animals dying of anthrax, the authors found substances which had the chemical characteristics of albuminoid, and which were poisonous. For all these poisonous albuminous substances they propose the class name "Toxalbumin."

THE RAPID HEART.

After alluding to the perplexities attending this subject, SANSON (*Provincial Med. Record*, 1890, ix, 332) says that he will treat only of that form of disturbance in which the abnormal acceleration of the heart-beat is the chief feature. From this category he excludes those cases in which organic disease of the heart was found to precede the signs of morbid acceleration, or in which the rapidity is associated with such conditions as anemia, fever, hemorrhage, the action of certain poisons, and the like, which are generally accepted as causes of acceleration. He also excludes the cases due to peripheral irritation, or in which the acceleration is simply paroxysmal, or the condition may be described as palpitation. The definition of palpitation involves a sensation of discomfort or distress accompanying the rapid cardiac action. In the cases which he describes the heart's action is unduly quickened, often for very protracted periods, but there are none of the painful concomitants of palpitation. The average normal rate of the heart-beat may

be taken as 72 per minute in males, and 80 in females. In the erect position these may be raised to 80 and 90 respectively. A rate observed under varying conditions to be over 90 in the adult is morbid. The influence of age must also be considered. The mean pulse-rate of the infant until the age of twelve months varies from 112 to 130 per minute while the child is awake and in a state of quietude. At six years of age the average rate is 100; and at thirteen years, 88.

The classes of cases in which, in adult life, a long-persistent abnormal rapidity of the heart's action has been observed are, for the most part, the following:

1. *Graves's disease.* In this affection there may be either paroxysmal attacks of accelerated pulsations, or the morbidly rapid action may be persistent. There is no doubt that the disease is often fatal, and that the chief cause of danger lies in the cardiac involvement. In fatal cases the heart is constantly found dilated and hypertrophied, but in no considerable degree, and the myocardium has been found in strictly normal condition.

2. *The irritable heart of soldiers.* The author refers to the original observations of DaCosta upon the persistently quick action of the heart found in numbers of the men engaged in the American Civil War. Not only hypertrophy and dilatation, but even valvular defects may probably result from this condition of irritable heart. As Hirsch has shown, there has been a notable increase of heart disease in communities living in great political and social excitement.

3. *Rapid heart in osteo-arthritis.* The author's own observations confirm those of Spender, that with the earliest signs of this affection there is a gradual rise of pulse-rate to 110 or even 120, and that this cardiac tumult does not always subside, even when the osteo-arthritic phenomena disappear.

4. *Rapid heart without notable morbid association.* Cases of this kind have been reported by several observers, in which extreme rapidity of the heart has persisted often for long periods, with little or no subjective sign of distress.

This condition of protractedly rapid heart is undoubtedly dangerous and frequently terminates in death. The views of writers are yet at variance as to whether the affection is one of the myocardium, or one of some portion or portions of the nervous system.

The author then proceeds to a review of seventy-five cases of rapid heart of the nature described, which have been under his observation. He divides these, for convenience, into two classes: First, those in which there was no association whatever with the recognized cardinal signs of Graves's disease. Second, those in which there was such an association, more or less marked. After detailing several interesting cases, he sums up the symptoms seen in forty-six cases of the first class: (a) *Circulatory phenomena.* The maximum pulse-rate varied from 90 to 160 in the majority of cases, and in a few instances from 160 to 260. In only three cases were there signs of dilatation of the heart, and murmurs were heard only exceptionally. The pulse-tracings show, rather, as a rule, that the arterio-capillary resistance is increased than that there is any of the low tension seen in the rapid pulse of fevers. (b) *Sensory phenomena* referred to

circulation or respiration were absent in one-third of the cases, but were present in the others with varying degrees of intensity. Pain about the heart was usually absent or slight. (c) The *probable disposing cause* of the onset of symptoms appeared in many cases to be some one of a very great variety of mental or physical overstrain. In other cases the oncome of the symptoms was gradual and associated only with vague dyspepsia. (d) Of *associated symptoms* restlessness and insomnia were manifested in a large majority. Among other symptoms occasionally seen were vertigo, tinnitus aurium, marked muscular tremors, mental troubles and aberrations, and exceptionally numbness, severe perspirations, spasmodic asthma, and probably syphilis. Osteo-arthritis was found in six cases, confirming the observations of Spender.

Sansom next takes up the second category of cases, twenty-nine in number, in which the rapid heart was associated with some of the phenomena of Graves's disease; and, after reporting some cases in detail, gives a summary of the symptoms seen in all of them. (a) In regard to the *circulatory phenomena*, the maximum pulse-rate varied from 108 to 200; systolic murmurs were present in over half the cases, and in a few instances there were signs of organic disease of the heart. The pulse-tracing showed that the rapid pulse had in some cases the same characters as those described in the first class, while in others it was extremely irregular. The author does not think that this irregularity of the pulse in Graves's disease has been sufficiently brought into prominence. (b) *Palpitation* was complained of by more than half of the patients. (c) The *probably disposing causes* were of the same nature as in the first class, though in a number of cases the onset was gradual, and no disposing cause could be assigned. The heart signs were the first to be noticed in the majority of cases. (d) Of the *associated symptoms* those on which the author lays the most importance were muscular tremors, defects of hearing, glycosuria, and severe perspirations, though others are mentioned.

Without entering fully into the question of the precise pathology of rapid heart, he thinks the evidence adduced is sufficient to make it in the highest degree probable that the two classes of cases described are closely allied. In both there is present the initiatory influence of psychical or physical overstrain, while in both the condition may develop without any such influence. In both, too, there is ground to believe that organic disease of the heart may be secondary to the nervous implication. He does not think that we should look upon cases of rapid heart as abortive forms of Graves's disease, but rather that the latter is an extended form of the former. The difference seems to be one of the extent of nervous implication rather than of the intensity of it. The signs of more extensive involvement of the nervous system are disturbance of the vaso-motor conditions of the great arteries of the neck; like disturbance in the thyroid arteries; a similar affection of the post-orbital arteries. In the first class of cases—in which cardio-motor conditions were disturbed without local vaso-motor involvements—it is to be noted that murmurs over the great vessels emerging from the heart were far less frequent than in the second class. It seems probable that a disturbed correlation between the heart and arteries was indicated by the existence of these murmurs. Concurrently with any or all of the signs mentioned may be an implication of the motor area, leading to muscular

tremors, and in some cases there may be an impairment of the powers of the mind.

Discussing treatment in a few words, he says that he has found digitalis and heart tonics generally of great value in the milder cases, but useless in severe ones. In these latter the systematic application of the galvanic current in the region of the great nerves of the neck has been very serviceable.

ON THE CONDITION OF THE LEFT CHAMBERS OF THE HEART IN MITRAL STENOSIS.

As a result of long-continued study of cases of pure mitral stenosis, LENHARTZ (*Wien. med. Presse*, 1890, No. 21, 850) has come to an opinion different from that usually accepted. This latter, namely, is that in mitral stenosis a concentric atrophy of the left ventricle develops, and those cases which do not exhibit this on post-mortem examination are to be regarded as exceptions. The author instanced some examples to show that even in extreme mitral stenosis a moderate filling of the left ventricle is possible through the establishment of compensation. He has had five female patients, suffering from undoubtedly pure mitral stenosis, who were able to walk about and to attend to their housekeeping—a thing which would have been impossible had they had concentric atrophy of the left ventricle. The autopsy made in one of these cases showed that the diagnosis was correct, and that the left ventricle possessed walls of normal thickness.

He has collected 75 cases of mitral stenosis from the reports of the Pathological Institute of Leipzig, and 22 from that of Halle; 61 of the first and 16 of the second were instances of stenosis of high grade, while in 20 cases the stenosis was of moderate degree. Only 7 of the total number of cases exhibited concentric atrophy, in 2 the left ventricle was "comparatively small," while in the remaining cases it was normal or hypertrophied, or in some cases dilated. In 34 instances the stenosis was so extreme that the possibly existing mitral insufficiency could have been of no importance in influencing the condition of the left ventricle, while in 11 of these cases the presence of insufficiency could be absolutely excluded.

From these observations the author draws the conclusion that the provisions for compensation, even in this lesion, are more favorable than usually considered. Factors in the sufficient filling of the left ventricle in this affection are: 1. Strong pressure produced by a hypertrophied right ventricle. 2. Pressure on the part of the auricle. 3. The suction action of the left ventricle, which has been physiologically established.

A further proof of the correctness of these views is found in the often surprising action of digitalis, which reestablishes the state of compensation. Digitalis acts not only on the left but on the right ventricle. It thus not only increases the power of its contraction at times when it is nearly exhausted, but, by increasing the length of the diastole, allows time for the filling of the left ventricle.

THE SIGNIFICANCE OF ALBUMINURIA.

GOODHART (quoted in *Practitioner*, April, 1890, 302) details his observations upon 272 cases of albuminuria; calling especial attention to the con-

gestive form, in which the patient complains of a certain amount of ill-health, while on inquiry it is found that he eats and drinks too much, takes no exercise, and probably is descended from a gouty ancestry. The urine in some cases is of high specific gravity, and contains only a small amount of albumin. Such cases are clearly not due to nephritis, and the treatment consists in the periodical administration of a purge, and in making the patient conform to the ordinary laws of health. A temporary albuminuria may sometimes be due to the admixture of leucorrhœal, seminal or prostatic discharge.

In cases in which albuminuria follows scarlatina, and is, therefore, presumably due to nephritis, and the patient continues in good health, Goodhart thinks that the phenomenon is to be explained by supposing that each organ has a margin of working power which can be temporarily encroached upon without bad result. He lays down the following as a good rule of practice in cases of albuminuria: If albumin be found in the urine, the case is one for further examination. If it be a young person, and the examination be conducted upon the morning urine, the albumin will probably have disappeared by the next examination, and it is a condition of no importance. If the albumin is in any quantity, and its presence is persistent, or reappearance frequent, it is a danger-signal. He believes that some of these cases, at any rate, are due to patches of inflammation irregularly distributed in the kidneys.

MENINGITIS AND PERITONITIS FROM PNEUMOCOCCI WITHOUT PNEUMONIA.

DEBOVE (*La Tribune Méd.*, May 22, 1890, 333) reports the case of a man of fifty-four years, who presented himself with the symptoms of cerebral excitation, similar to those of alcoholic delirium. The symptoms of peritonitis then developed, and the patient died in three days. The autopsy showed a general purulent peritonitis with a purulent infiltration of the meninges. The other organs were entirely normal. The pus was of creamy consistence, green color, and considerable tenacity—the macroscopic characters of the pus of pneumococci. Bacteriological examination revealed pneumococci in the pus from both localities. The author speaks of the difficulty in determining the etiology of the double localization. It would seem most probable that there was a general infection of the organism by the pneumococci, which had settled in the meninges and peritoneum, but had spared the lungs.

SURGERY.

UNDER THE CHARGE OF

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THE TREATMENT OF GOITRE BY OPERATION.

This subject is briefly discussed by BERRY (*Birmingham Medical Review*, June, 1890). He divides all innocent forms of goitre into two classes;

namely, those in which the whole gland is more or less uniformly enlarged, and those in which the increase in size is dependent on the development of one or more definite cysts or solid tumors, generally in one lobe only of the gland.

The bilateral and uniform enlargement of the whole gland consists in most cases in an increase in the amount of colloid material in the thyroid vesicles. It is practically a hypersecretion of colloid material into all the vesicles of the gland. The enlargement is rarely due to hypertrophy of the solid constituents. It is not dangerous in itself, but may produce death by mechanically interfering with the functions of important organs.

The operative measures adopted for the cure of parenchymatous goitre are :

1. Division of the isthmus with or without removal of a portion of it.
2. Removal of all the goitre except a small piece on each side of the trachea.

3. Extirpation of one-half or more of the gland. Under some circumstances division of the thyroid isthmus is followed by marked relief of dyspnœa and by decided diminution in the size of the tumor.

It relieves dyspnœa not by mechanically allowing the two halves of the goitre to separate, but by draining the gland of its colloid secretion. The relief afforded may be permanent, but frequently the goitre reappears when the wound has healed and the secretion is again pent up in the gland. In many cases attended by urgent dyspnœa the operation does not relieve the dyspnœa quickly enough, and the operator is compelled either to do a tracheotomy, or, what is far better, to remove a considerable portion of the tumor.

For the removal of the greater part of the goitre Mikulicz performs a resection in the following way: One lobe of the goitre is first isolated as though it were to be removed, its attachments on the inner side being untouched, since here the inferior thyroid artery enters and the tumor is in contact with the larynx, trachea, and recurrent laryngeal nerve. In this position a portion of the gland of considerable size is left intact to avoid the supervention of artificial myxœdema. The portion of the tumor on the other side of the neck is treated in the same way. Of twenty-three reported cases of this operation but one perished. The cause of death was recurrent hemorrhage, the ligature having slipped from the superior thyroid artery. Bilateral parenchymatous goitre is sometimes treated by the removal of one lobe. The opposite lobe is, however, prone to become hypertrophied.

In the thyroid hypertrophies affecting one side of the gland, namely, in the so-called unilateral goitres, the enlargement is due in all cases to the development in the gland of one or more distinct tumors, either cysts or adenomatous growths of some kind. Generally parenchymatous hypertrophy distinctly predisposes to this form of cystic or solid growth.

The unilateral goitre may be removed either by enucleation or removal of the tumor from the exterior of the gland, leaving everything else behind, or extirpation, by which the whole of the affected lobe is taken away. Enucleation is of course suited only to those cases in which the goitre forms a well-defined tumor imbedded in the glands. Of 37 cases collected by Keser all recovered.

V. EISELBERG (*Prag. medicin. Woch.*, No. 23, 1890) discusses the question of tetany following extirpation of the thyroid gland, one of the

most common sequelæ of the operation. The subsequent histories of 37 out of the 53 cases of total extirpation of the thyroid gland performed in Billroth's clinic were obtained. Of these 37 cases 13 developed tetany—this disease terminated fatally in 8 cases, in 2 it assumed a chronic form, while the remaining 3 recovered—2 patients developed myxœdema, 2 died immediately after operation, and 19 recovered. Seven of these last, however, suffered from a return of the thyroid tumor. One hundred and fifteen cases of partial resection were in no instance followed by the development of tetany, and this sequel was likewise absent in seven cases of ligature of the arteries.

The development of tetany after operation upon the thyroid is not influenced by wounds of the nerves, by personal idiosyncrasy, by sex, age, or the cause of the wound; it depends entirely upon the effect produced by the total removal of the gland. To further confirm this fact a number of experiments were instituted upon animals. Cats were chosen because they possess no accessory glands. The results observed were as follows:

Total extirpation of the thyroid (33 experiments) gland was invariably followed by tetany, and the appearance of this sequel was not prevented by transplantation of thyroid substance under the skin, in the peritoneal cavity, or between the peritoneum and the abdominal wall, whether such transplantation was made before or after the operation. Injections of the juice of the thyroid gland were also without effect.

In twenty-seven extirpations of one-half of the thyroid, tetany was not observed in a single instance. In four instances hypertrophy of the remaining portion of the gland was observed.

When the thyroid gland was removed by two operations performed at two periods, tetany appeared as soon as the second half was extirpated. In two cases only did it fail to develop. In these the transplanted half first removed was found organized.

Enucleation, with ligature of the vessels supplying the thyroid, was followed by tetany.

In a series of experiments to determine how much of the gland may be safely removed, it was found that if less than one-fifth were left tetany developed.

SUBCUTANEOUS RUPTURE OF THE URETER AND ASCENDING COLON.

CHAPUT (*Bull. et Mém. de la Soc. de Chir. de Paris*, T. xv. p. 202) reports a case which terminated in recovery in spite of a laceration of the colon and rupture of the ureter requiring nephrotomy. The patient was kicked in the right lumbar region by a horse. This injury was followed by severe pain, resembling that characteristic of renal colic, the development of a moderately tender swelling in the lumbar region, vomiting, and constipation. The urine contained no blood and was passed in normal quantity. The administration of a purgative on the fifth day was followed by a movement from the bowels. The swelling in the lumbar region diminished in size. A tumor now formed in the upper portion of the iliac fossa, and was accompanied by the development of a moderate fever. Exploratory puncture of the tumor showed that it contained a turbid, reddish-colored, purulent liquid. In the idea that the

tumor was caused by a suppurating blood extravasation; it was freely incised. This incision opened the peritoneal cavity. A round swelling the size of two fists was found beneath the wound, and was incised. A red-colored feculent liquid was discharged. It was then found that the swelling consisted of the greatly distended cæcum, the posterior wall of which had been ruptured. By this rupture the bowel communicated with a considerable cavity lying behind the parietal peritoneum. The rupture of the bowel, the incised wound, and the opening into the peritoneum were all sutured. The peritoneum was then stripped forward and inward until the cavity lying posterior to it was exposed. It was found to contain bloody urine. This established the fact of rupture of the ureter. The cavity was drained. A fecal fistula was subsequently formed. After several weeks the right kidney was extirpated. On examination it was found to be infected with a suppurative nephritis. Not having suitable ligature material, the operator applied two hæmostats to the stump left after removal of the kidney. These were removed the following day. The same evening the patient suffered from a violent hemorrhage. The patient, however, recovered, his fecal fistula closed spontaneously, and he was discharged well.

A SUCCESSFUL CASE OF INGUINAL COLOTOMY FOR ABSENCE OF RECTUM IN A CHILD FIVE DAYS OLD.

The importance of examining the anus and rectum for congenital defects before resorting to purgative medicines when the bowels do not operate spontaneously in newly-born children is well illustrated by the following case reported by HELME (*Brit. Med. Journ.*, July 7, 1890).

On superficial examination the child presented all the appearances of perfect formation. The bowels not having been opened in the first two days following birth, castor oil was administered, and the dose was repeated several times in the next three days. Finally, on attempting to give an injection, it was found impossible to force the liquid into the bowel. This led to a careful examination, which showed that the anus was blocked by a mucous septum about half an inch from the skin-surface. From the fact that no bulging could be felt during the child's straining it was evident that the lower end of the rectum was not in contact with the septum. A puncture of the membrane was followed by no escape of intestinal contents. On carefully enlarging the opening and introducing the finger into the peritoneal cavity it was found that the rectum was altogether wanting. Left inguinal colotomy was then performed in the usual way, the bowel being opened at once and evacuated of its contents. The child recovered with an artificial anus.

SUCCESSFUL LAPAROTOMY FOR THE CURE OF INTUSSUSCEPTION IN A CHILD OF SIX MONTHS.

The rarity of a successful termination of laparotomy performed for acute intestinal obstruction in very young children induced RYAN (*Australian Med. Journ.*, March 15, 1890) to report the following case. The child, aged six months, had been costive from birth, often going for days without a passage. After a diet of tripe, bacon, and parsley sauce he suffered from

sharp colicky pains. Shortly after, vomiting set in. On examination a sausage-shaped tumor was felt in the left hypochondrium. The abdominal walls were comparatively lax and the tumor could be readily felt. As an additional characteristic sign, a small, slimy, slightly blood-stained motion was passed. No tumor could be felt on introducing the finger into the rectum.

Fourteen and a half hours after the first colicky pains, median laparotomy was performed. After considerable manipulation and the exposure of a good deal of intestine the sausage-shaped tumor was brought to the abdominal incision. The transverse and descending colon were stripped back from the outside of the tumor for some distance and then suddenly the remaining portion of the invagination underwent spontaneous reduction, exposing the ileo-cæcal valve. The abdominal cavity was then irrigated with warm boric lotion and the parietal wound was closed. After the operation a suppository containing gr. $\frac{1}{4}$ of morphia was given. In a few hours the child was allowed to nurse. He was kept quiet by opium, and passed flatus the day following the operation. On the second day the bowels were freely opened spontaneously. Five days later there was a prolapse of small intestine through a portion of the wound which was gaping. The gut was replaced and the wound closed by two silver wire sutures. One of these sutures formed an abscess and was discharged; the other passed into the peritoneal cavity and a month later was passed by the bowel. Since this time the child has been entirely well.

Ryan states that he has performed the operation three times, with but one success; this he attributes mainly to early operative interference.

ON THE SURGICAL TREATMENT OF TUBERCULOSIS OF THE PLEURA AND LUNGS.

TILLMANNS (*British Medical Journal*, June 14, 1890) reports an extraordinary case of operative procedure directed to the relief of extensive tubercular disease, involving the entire lung of one side, together with the greater portion of the pleura.

Three years before the patient came under observation six quarts of pus were removed from the left chest by means of puncture. Twice after this thoracotomy was practised, with resection of a piece of rib at the lower posterior portion of the thorax.

When the patient was first seen by Tillmanns he presented the appearance of one in the last stage of phthisis. The left lung was universally infiltrated with tubercles, the pleura being firmly adherent to its upper third. Numerous tubercle bacilli were found in the sputum. The lower two-thirds of the left pleura were filled with pus. Several fistulae were found in the anterior chest-wall, which was also the seat of disease. The heart was dislocated to the right, lying behind the sternum. The right lung was comparatively healthy and acted well. The patient had been affected with empyema for three years, and during this time had been nearly constantly confined to bed.

In April, 1888, the reporter endeavored to cure the left-sided empyema by means of extensive rib resection. A portion of the thoracic wall was removed measuring in breadth two inches at its upper part and five inches at its lower

part, extending from the second to the sixth rib in front, and involving the seventh, eighth, and ninth ribs behind. On removal of the thoracic wall the whole of the left pleura was found to be tubercular to a high degree. The left lung was phthisical, and no larger than a man's fist, and was firmly adherent at the level of the first rib. The pleura was vigorously scraped with a sharp spoon and the cavity was stuffed with iodoform gauze. The affected lung was partly covered by a pedunculated skin-flap taken from the thorax; this was arranged in such a manner that treatment could still be applied to the diseased organ if this subsequently became necessary. A month later the left pleura was again thoroughly scraped, and was then converted into a cutaneous cavity by transplantations of skin according to Thiersch's method. The left lung steadily diminished in size, and the tubercles of which it was the seat underwent a process of spontaneous cure in consequence of cicatricial contraction.

The subsequent course of this patient has been most gratifying. He attends to business, has gained in weight, and presents the appearance of robust health. The collapsed left lung can be felt in the upper part of the left thorax at the level of the first rib. The right lung is absolutely healthy. The left pleura is a skin cavity the size of a man's fist and is covered with epidermis. On deep inspiration the anterior mediastinum is arched to the left. The movements of the heart can be seen and felt. Tillmanns recommends that in similar severe cases of unilateral tuberculosis of the pleura and lung the same procedure should be adopted. That is, the seat of disease should be exposed sufficiently for local surgical treatment by free resection of the chest-wall in front or behind. In suitable cases a temporary resection may be recommended. A pedunculated section of skin and bone may be turned back; afterward, when the disease of the left lung and pleura is cured, the thoracic flaps can be replaced in their normal position. In the case reported the anterior wall was entirely removed. This would not have been done except that it was extensively involved in the tubercular disease.

This case is particularly important, when it is recalled that Hofmokel, in an article entitled "Clinical Contributions to the Surgery of the Pleura and the Lung," states that all the tubercular cases (twelve in number) treated by surgical intervention perished, and that abstention should be recommended in these cases.

OTOLOGY.

UNDER THE CHARGE OF

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MENTHOL IN THE TREATMENT OF FURUNCULOSIS OF THE AUDITORY CANAL.

CHOLEWA, of Berlin, likens the pathogenic condition of primary furunculosis of the external ear to a culture of microorganisms. He therefore re-

commends the use of a twenty per cent. solution of menthol on a dossil of cotton pushed into the affected ear canal. This application at first causes some burning, which, however, soon disappears. This application may remain in position twenty-four hours, when it may be renewed, this plan being followed out until the cure is effected. If suppuration ensue, the abscess must be opened, and the menthol treatment continued. This treatment is based on the discovery of Koch, that a solution of menthol, 1 : 2000, will destroy the cholera bacillus, while a solution of 1 : 33,000 inhibits the development of the bacillus of splenic fever.

REGENERATION AND CICATRIZATION OF THE MEMBRANA TYMPANI.

RUMLER contributes an interesting article on this subject in the *Archiv für Ohrenheilkunde*, vol. xxx., May, 1890, Parts 1 and 2. His conclusions are as follows:

1. In the closure of a perforation in the drum-membrane, the epithelium of the outer surface takes the initiative, the first manifestations of cell multiplication occurring in the course of six hours.

2. In the course of forty-eight hours the epithelium of the mucous membrane participates in this activity, but does not play an important part at any time.

3. From the third day the growth of connective tissue becomes prominent, and completes the final closure.

4. The membrana propria takes very little, if any, part in the process of healing.

The article is illustrated by several beautiful and explanatory micro-engravings.

FATAL BLOW ON THE EAR.

HEIMAN, of Warsaw, narrates the case of a young man, twenty-one years old, who, while feeling unwell and weak, received a blow with the hand on the left side of his face. He at once felt vertigo, and ceased work, and it is said that there was bleeding from the ear which lasted two days. He had never had headache, but pus was said to have come sometimes from the left ear. An examination made two days later showed dulness, clouded intellect, difficulty in moving the tongue, vertigo and nausea upon moving; temperature 40.5° C.; pulse 120, quick and small. Dried blood was found on the auricle, and in the auditory canal a moderate quantity of bloody and purulent secretion. The membrana tympani was reddened, and a small perforation was detected in the antero-inferior quadrant. Conduction of sound by the cranial bones was maintained on both sides. There was considerable swelling of the spleen, and tenderness in the ileo-cæcal region. There soon ensued paralysis of the abductors on the left side, dilatation of the pupils, and ptosis, with icterus, tenderness, swelling, and suppuration in the left carpo-radial joint. Unconsciousness and delirium set in, attended with involuntary urination and defecation, and in eight days from the time of receiving the blow, the patient died.

Post-mortem examination revealed pachy-meningitis interna purulenta diffusa; small, numerous sub-arachnoidal extravasations of blood; hyperæmia

of the meninges and brain substance, with lepto-meningitis basilaris circumscripta. A yellowish thrombus was found in the superior longitudinal sinus, and a dark-red one in the transverse sinus and in the internal jugular vein. Chronic middle-ear suppuration, with carious destruction within the mastoid process, and three small openings in the tegmen tympani, were discovered. Furthermore, there were found purulent inflammation of the left carpo-radial joint, incipient exudative purulent pleuritis, metastatic infarct in the lower lobe of the right lung, parenchymatous hepatitis and nephritis; acute swelling of the spleen, and catarrhal enteritis, with very numerous extravasations of blood in the mucous membrane. It is of forensic interest to bear in mind that the fatal result of the disease in this case would have happened very soon even if no blow had been received on the diseased ear. The blow at most could only have hastened the development of the fatal process in the middle ear and temporal bone. (Blair, *Archiv für Ohrenheilkunde*, vol. xxx., May, 1890.)

THE MASTOID PROCESS AND ITS ARTIFICIAL PERFORATION BY CHISELLING.

A. RICORD having investigated the description of the mastoid and its cells, as well as the details of the operation of opening this part of the petrous bone, as set forth by classical French writers, corrects the errors which he has found therein, and sets forth the plans he considers best for artificially opening this part of the temporal bone (*Gazette des Hôpitaux*, February 23, 1890; also review of same in *Archiv für Ohrenheilkunde*, Bd. xxx., May, 1890). He concludes that the posterior half of the mastoid is the dangerous part, because of its proximity to the sinus, while the anterior portion is not only less dangerous, but is also the only part which usually contains the cells which communicate with the drum-cavity. He maintains that the mastoid cells, or the petro-mastoid cells as he prefers to call them, are not a special group of cells, but simply an appendix or a prolongation of the cellular structures of the petrous bone. These are always present, whereas the true mastoid cells vary greatly in development, not only in different individuals but in the two bones in the same person. The study of the development of the air-containing structures of the ear shows that in the newborn child they are first formed about the drum-cavity in the petrous bone, and later in the mastoid process. This is demonstrated by twenty engravings.

The artificial opening of the mastoid is then considered. The method advocated by Poinsoot was to operate at a point 1-1½ cm. behind the auricle on a level with the upper wall of the auditory canal, while Delaisement advised penetrating the process near its point. Ricord, however, basing his action on his anatomical investigations, recommends operating on the anterior part of the mastoid, like Politzer, Duplay, and others. He makes an incision through the skin on or near the line of attachment of the auricle, and throws the latter forward so as to expose the anterior surface of the mastoid. If the auricular artery is severed in this act, and cannot be ligated alone, the entire thickness of the flap may be caught by forceps and left thus for some hours (Tillaux). He rejects the trepan, but adheres to the hollow chisel. The bone should not be penetrated further than 12-15 mm., so as to

avoid the danger of wounding the facial nerve or the inner ear, especially the semicircular canals.

SARCOMA OF THE DRUM-CAVITY AND THE MASTOID PROCESS.

R. HAUG, of Munich, reports the following case of sarcoma of the drum-cavity and the mastoid process. (*Archiv für Ohrenheilkunde*, vol. xxx., May, 1890.) The patient, a woman, eighteen years old, states that she had whooping-cough at three years of age. From that time she suffered with otorrhœa of an intermittent character from the left ear. At eight years of age she contracted scarlet fever, when the ear grew worse. The hearing appeared to have been not much affected. Hemorrhages from the ear had never occurred. The beginning of the later aural disease is attributed by the patient to her own action in picking the ear with a hair-pin, immediately after which the ear began to bleed. Soon after a tumor appeared in the inner part of the auditory canal, which was said to be visible to the patient's family, but which was not apparently seen at that time by the physician in attendance. About a week later, however, the physician in charge saw a whitish tumor and removed it with forceps. In four weeks it had grown again, so as to lead to the same method of removal again. In February, 1889, the tumor was removed a third time, in the same way; and in May of the same year, the tumor was operated upon in the same way a fourth time. Each operation was followed by a more intense growth, and the hemorrhages became greater, and the tendency to bleed very marked, hemorrhage being induced by the least irritation of the diseased parts. As long as the growth was limited to the auditory canal the pain was slight, but as soon as it extended outside of the canal the pains increased in intensity. By the beginning of the following May, besides glandular enlargement beneath the lower jaw, a very painful tumor in the mastoid region made its appearance, from which in the course of a few days, after the skin had broken, without suppuration, however, there projected spongy masses of tumor, which bled upon the slightest irritation, and in twelve days had nearly reached the size of a pigeon's egg. Small pieces of the same kind of tumor came from the mouth and nose upon several occasions.

In April, 1889, the hearing in the right ear was normal; in the left, loud noises were heard about one metre. From the left external auditory canal there projected a tumor the size of a walnut, of livid hue, and of soft, spongy consistence, entirely unconnected with the auditory canal or the auricle. There came from it the characteristic odor of necrotic tumor. Two tumors of similar size were behind the auricle in the mastoid region. The mastoid region presented the only part sensitive to pressure. There was some enlargement of the submaxillary glands. The eyelid could be normally closed, and there were no symptoms of facial paralysis. The slightest touch of the tumor produced profuse hemorrhage, for which reason the morbid growth was sprinkled with a powder composed of sabina and alum.

An anæsthetic having been given, the morbid growth was removed as far as possible, by means of a sharp spoon, from the tympanic cavity and the mastoid cells, the latter's pneumatic spaces being found broken down and converted into several large irregular cavities. The hemorrhage, which was con-

siderable, was checked, at least in the antrum, by means of the thermo-cautery, and then all the cavities were packed with iodoform gauze, which checked all further bleeding. There were no meningitic or nervous symptoms, and the patient left the hospital in a few days in good subjective condition. There were no pains, nor any signs of regrowth of the tumor for five weeks. In the sixth week after the operation the tumor began to grow again; two months later had attained a larger growth than ever, and the patient began to emaciate. Facial paralysis now appeared, and three months after the operation the patient died of meningitis. The entire process, from the discovery of the first growth, lasted eleven months.

THE TEMPORAL BONE IN A CASE OF SO-CALLED MÉNIÈRE DISEASE.

LANNOIS had the opportunity of examining the temporal bones of a patient who died of Bright's disease, and who had previously suffered from the peculiar symptoms of aural vertigo, or so-called Ménière's disease (*Société des Sciences Méd. de Lyon*, November, 1888; *Lyon Medical*, No. 1, January, 1889; *Archiv f. Ohrenheilkunde*, vol. xxx., 1890).

In one of the bones there was a distinct ankylosis of the anterior crus of the stapes, so that its posterior part could sink into the oval window, but not the entire bone. Further, there was ankylosis of the entire chain of bones with one another, and the head of the malleus was adherent to the walls of the drum-cavity by means of fibrous bonds, so that the entire chain of auditory ossicles was held stiff. The microscope revealed a normal cochlea, excepting a small decrease in the nerve-fibrillæ in the lamina spiralis. In the other ear there was a similar change in the stirrup and oval window. The membrane of the round window was hard, dry, and only slightly movable. The labyrinth appeared normal in all its parts. On the strength of these anatomical changes, the author feels justified in concluding that *Ménière symptoms are not always the result of disease of the labyrinth*, a view we have long held and proclaimed.

FOREIGN BODY IN THE EAR.

SCHUBERT, of Nuremberg, reports a case of foreign body in the ear, unskillfully managed by a physician, which finally terminated fatally from the irritation set up by the rough endeavors to remove it. (*Archiv f. Ohrenheilkunde*, vol. xxx. p. 50, May, 1890.)

A little girl, five and a half years old, was brought to Schubert's clinic with a bean in her right ear, where it had been four days, and which the family physician had tried in vain repeatedly to remove with instruments. There was a copious muco-purulent discharge from the ear, and the auditory canal was swollen, so that the foreign body could be seen with difficulty in the fundus of the ear. As there were grave symptoms, the treatment was limited to antiseptic syringing and antiphlogosis, without touching the foreign body with any instrument. On the fourth day after she was first seen and treated, as stated above, the mother appeared alone, and stated that the child had been attacked with opisthotonos and severe fever, and that she had determined to remove her to their home in another town.

All warnings and persuasions failed to induce the mother to consent to

an operation for the removal of the foreign body from the ear. She removed the child from the aural clinic, and nothing more was heard of the case for some months, when it was learned that the child, after lying six weeks in bed, at last died with abscesses in the left arm and left hemiplegia. The foreign substance was in the right ear.

PERFORATION OF THE MEMBRANA FLACCIDA; CHRONIC SUPPURATION OF THE ATTIC.

SCHUBERT, of Nuremberg, gives the history of some of these important cases seen and treated by him. (*Archiv für Ohrenheilkunde*, vol. xxx. p. 52, May, 1890.)

With increasing experience the conviction is now firm that the majority of these cases can be cured only by operating on the diseased malleus or other diseased bone tissue in the attic. Within the last five years Schubert has observed nineteen cases of perforation in Schrapnell's membrane (*membrana flaccida*). The result in four of these is unknown, because the patients withdrew from observation. In all the cases daily injections with delicate curved metallic tubes were made into the diseased space above the short process. Also granulations were sawed off as they appeared. Narrow perforations were enlarged, injections were even made through the Eustachian tube into the drum-cavity. In four cases this could not control the suppuration; in two cases mastoid disease set in; the mastoid process had to be trephined or perforated. In two cases the diseased malleus was excised, and these were permanently and promptly cured. In eleven other cases, after many months of painful and exhausting treatment, the purulent cavity became dry, no granulations appeared, and the visible portion of the little cavity appeared cicatrized, or to have a smooth, epithelial surface. In the major part of these cases, however—that is, in six of them—a relapse occurred in from nine months to two years, because there had been no radical cure of the disease, as there would have been by excision. The author is, therefore, entirely opposed to the irrigation treatment so highly prized by Gompertz, among others. Relapses are the rule when an apparent cure is obtained by any other means than excision—an experience common to the aurist of longest practice.

The removal of the carious hammer is in accordance with general surgical principles.

That such an operation does not injure the functions of the ear is shown by some cases detailed by Schubert; in one before the operation the watch was heard 5 cm.; Politzer's acoumeter 1.20 metre; and whispered words $\frac{1}{2}$ –1 metre. A week after the operation the watch was heard 10 cm.; the acoumeter 2.50 metre; and whispered numerals 4 metres. In one month after the operation the perforation in the *membrana* was nearly closed.

In another case, in which there was a detectable caries in the neck of the malleus, the hearing before the operation was 10 cm. for the watch: loud words 1–2 metres. In six weeks after the operation the perforation in the *membrana tympani* was healed, and all traces of a discharge were gone. The watch was heard 13 cm.; loud words $\frac{1}{2}$ –1 metres, some words being heard 2

metres. In two months later, no secretion, loud words 5 metres; whispers 1 metre and plus; many words heard as far as 5 metres.

These are remarkable results in a disease incurable in our experience until we resorted to excision, and invariably attended with profound deafness, very offensive discharge, attacks of pain from blocking of the suppuration back in the attic cavity, and a paramount risk of an extension of the chronic inflammation in the drum-cavity to the meninges of the brain, as long as the carious bonelet is in the tympanic cavity.

PROGRESSIVE DEAFNESS (SCLEROSIS) AND ITS TREATMENT BY TENOTOMY OF THE TENSOR TYMPANI.

CHOLEWA, of Berlin, like Kessel, of Prague, has recently revived this operation, suggested twenty years ago by Weber-Liel, then of Berlin, now of Bonn. (*Archives of Otology*, vol. xix., April-July, 1890.)

While Cholewa was making some tuning-fork experiments last spring, he concluded that "the very best that could be done in those cases of sclerosis of the tympanum with a relatively good bone-conduction" was the above-named operation, for he deemed it probable that this might "improve the function of the intra-tympanic and muscular apparatus for the perception of sound, words, and speech." His subsequent operations in this way have confirmed these views.

In progressive deafness there are two characteristics (Kessel and others), viz.: 1, Great resistance in the mechanical apparatus, "mechanical deafness;" 2, organic alterations in the nervous terminal apparatus, "nervous deafness."

In most cases of sclerosis the bone-conduction of the tuning-fork vibrations is equally reduced in both ears. Active perception in both ears is greater than the bone-conduction.

Cholewa also claims to have first pointed out that in neuropathic sclerosis there is a "pronounced anæsthesia of the membrana tympani," as shown by touching it with a probe, and that the worse ear offers the greater anæsthesia. Also that the better the hearing the less anæsthetic the membrana, and the more the aerial and bone-conduction of sound have suffered, the more marked and the more extensive the anæsthesia of the entire drum-head. "Hence, for the very reason that the objective examination almost always leaves us entirely at sea, this symptom of 'equivalent anæsthesia' is to be highly recommended as one of the chief diagnostic points in the diagnosis of neuropathic sclerosis."

Then follow notes of thirty operations of tenotomy of the tensor tympani, with five failures. The operations of Cholewa, Weber-Liel, and Kessel show that "when the operation was done on the ear that had previously been shown to be the worse of the two (tuning-fork tests), with probable ankylosis of the ossicle, and was of no benefit at all to that ear, nevertheless the hearing of the other ear was decidedly improved."

It is also maintained by the author of the article that tenotomy of the tensor tympani, as asserted by Weber-Liel and Kessel, may be very beneficial in many cases of apparently hopeless deafness. Although the best results are obtained when the chronic catarrh of the middle ear has not advanced too

far, nevertheless it is of use even in advanced cases, as it relieves tinnitus and improves the hearing.

In so-called "neuropathic sclerosis" the operation should be performed when bone- and aërial conduction have not fallen too low. At least one-quarter of the normal duration of perception of the tuning-fork by aërial conduction should be present in a case to be operated upon.

The operation should be done on the worse ear when we have reason to suspect permanent obstructions to conduction to this ear, whilst there are no traces of such change in the better ear.

"If one ear is totally deaf, and the other is growing deaf, the operation is advisable on the latter, on the ground that the reduction of the tension in one side of the muscular apparatus will benefit that of the other."

All that is claimed for tenotomy of the tensor tympani by Cholewa is also claimed by others for excision of the membrana and the malleus, as the latter operation includes the former, and there can be no reunion of the tendon after the removal of the malleus.

DERMATOLOGY.

UNDER THE CHARGE OF

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THERAPEUTIC NOTES.

Compound chrysarobin ointment, used chiefly in psoriasis, is, according to UNNA's formula (*Monatshefte für prak. Derm.*, Bd. x. No. 1), composed of chrysarobin 5 parts, salicylic acid 2 parts, ichthyol 5 parts, and vaseline 88 parts.

Aristol ointment (*Brit. Journ. of Derm.*, June, 1890) is recommended by EICHORFF: aristol 3 to 10 parts, vaseline 30 parts. It is said to be not less efficacious than chrysarobin in psoriasis, and to have the advantage over the latter that it does not stain the skin or irritate.

Bougard's paste, a powerful escharotic, useful in epithelial cancer, is composed of wheat flour 60, starch 60, arsenic 1, cinnabar 5, sal ammoniac 5, corrosive sublimate 0.50, solution of chloride of zinc 2.45. The first six ingredients are to be separately ground and pulverized, and then mixed together in a glass mortar. The zinc solution is then to be slowly added, while the contents of the mortar are kept rapidly moving by means of a pestle.—*Brit. Journ. of Derm.*, June, 1890.

LASSAR (*Deutsche med. Wochenschr.*, 1890, No. 12) also speaks well of aristol in psoriasis. It acts upon the lesions after the manner of pyrogallie acid and chrysarobin, but without exciting irritation.

BROcq extols (*Journal of Cutaneous and Genito-urinary Diseases*, July, 1890, p. 266) the cicatrizing properties of aristol, applied in powder, in various ulcerations of the skin, such as syphilitic, scrofulous, and epitheliomatous. Several illustrative cases are reported, more or less in detail. The application has advantages over iodoform in being less irritating, and free from odor.

SAALFELD (*Therap. Monatsh.*, 1890, No. 1) recommends sublimate-vinegar as a convenient and safe remedy for pediculi pubis.

JACKSON (*N. Y. Medical Journal*, Oct. 12, 1889) speaks well of hydroxylamin in the treatment of psoriasis. The remedy does not irritate so much as pyrogallol and chrysarobin; is cheap, leaves no stains, and works as quickly as the older remedies. It is best to begin with weak solutions (1 : 500) and to increase the strength.

IMPETIGO HERPETIFORMIS.

DUMESNIL and MARX (*Archiv für Derm. und Syph.*, 1889, p. 657) report a case of this rare disease, independent of pregnancy, occurring in a woman thirty years of age, the wife of a tailor. The disease consisted in the rapid development of small pustules, pustular from the beginning, and always arranged in groups, the central lesions coalescing and crusting, and new pustules forming on the periphery. The eruption began about the genitalia and gradually spread over the whole body. The mucous membranes were also affected. In the course of the disease, chills, heart-palpitation, vomiting, and nystagmus occurred. Upon excoriated places on the skin, as well as in the mouth, papillary excrescences formed.

AUTOGRAPHISM.

MESNET (*Brit. Journ. of Derm.*, May, 1890) has observed four cases of a peculiar nervous affection of the skin, to which he has given the name of *autographism*. If a blunt-pointed object, like a pencil, be drawn over the skin, there instantly follows a bright, somewhat diffuse red mark, succeeded after a minute or two, by a pale line, which gradually becomes more and more raised above the level of the skin. Elaborate patterns traced on the skin become visible in this way at a distance of over twenty yards. In the cases observed there were all the symptoms of hysteria; in some the skin was anæsthetic. It is not a mere transitory or ephemeral condition, for the cases were observed for a period of ten, eight, six, and two years respectively, and autographism was constantly present. It is evidently a reflex neurosis, and belongs, probably, to the same group as urticaria factitia.

PSOROSPERMS IN PAGET'S DISEASE.

J. HUTCHINSON, JR. (*Lancet*, March 29, 1890), at a meeting of the Pathological Society, showed specimens illustrating the presence in this disease of psorosperms or coccidia. The parasite, of oval or rounded shape, and one-thirtieth of a millimetre in length, was found in the thin layer of the epi-

thelium which covered the affected skin. Each coccidium had a shell which, on section, presented the appearance of a double contour. Often a small knob or aperture at one end, the micropyle, could be distinguished. In the interior, one or more globular masses were to be seen, and sometimes the psorosperms might be observed.

M. Darier, who discovered the parasites in this disease, in 1889, stated that the easiest way of demonstrating them was to scrape the surface, and to treat the scrapings with iodine solution or bichromate of potash. The best method, according to Hutchinson, is to soak the scraped epithelium with liquor potassæ and mount it in glycerine jelly. The parasite appeared to be the same as that infesting the liver or intestines of rabbits and mice. Dr. Crocker has found these psorosperms in abundance in a case of Paget's disease of the scrotum. Dr. Delépine, who had been working at psorospermia for six months, had no doubt that the specimens shown were of that nature.

ERYTHEMA SCARLATINIFORME.

This affection, according to BESNIER (*Brit. Journ. of Derm.*, June, 1890), may resemble scarlatina closely. It is febrile for a part or the whole of its course when that is short. There may be shivering, headache, lassitude, and sore-throat at the commencement. The redness begins locally, soon becomes general, and complications, such as albuminuria, may occur. While the rash is at its height the temperature may abate, a point which may help to distinguish it from scarlatina. The other characters which distinguish it are the variable and prolonged period of the eruption, the coexistence of rash and desquamation, non-contagiousness, tendency to relapse, and to occur at certain seasons (spring and autumn), and its causation. This form of erythema, like erythema generally, may be produced by the most varied causes, and yet never lose its identity. Its characters are just the same whether it has been provoked by an external or internal toxic agent, such as mercury, or whether it results from chill, gonorrhœa, or any other cause. There is no specific cause. What will produce it in one person will fail to do so in another, or even in the same person under different circumstances. The effect often continues to persist long after the cause has ceased to exist, and may in duration and intensity be out of all proportion to the nature, energy, duration, or mode of application of the cause.

Erythema scarlatiniforme occurs occasionally (though less frequently than erythema multiforme) in the course of rheumatism, infectious virulent diseases (reactionary stage of cholera), toxæmia, blenorhagia, syphilis, alcoholism. The cause is frequently external, as in the case of laborers working at high temperature, leather-dressers, etc.; or it may be due to some medication, of which mercury occupies the first rank. Among the internal toxic agents, mercury again holds the first place, then belladonna, opium, arsenic, quinine, chloral, carbolic acid, iodides, antipyrin, and salicylates.

A PRELIMINARY TREATMENT OF LUPUS VULGARIS.

BROOKE (*Brit. Journ. of Derm.*, May, 1890) recommends the following ointment as useful for carrying on prolonged treatment in this disease, where

irritation of the skin is not permissible, or in those cases where the well-known heroic measures cannot be practised. The ointment is composed of oleate of mercury ($2\frac{1}{2}$ per cent. to 5 per cent.), 1 ounce; salicylic acid, 10 to 15 grains; ichthyol, 15 minims; oil of lavender or oil of citronella, q. s. It is better to begin with the milder ointment and increase gradually. The skin must not be broken by the application. If it becomes sore and threatens to break, the ointment may be weakened with lard. Open sores will often heal under the action of this weakened preparation. The longer the inunction is continued the better—say, twenty minutes at night and ten minutes in the morning. A dusting of starch-powder after the inunction is finished, both keeps the ointment fixed on the skin and takes away the unpleasant sensation of greasiness. Dr. Brooke has employed this treatment for over three years on a large number of patients, with satisfaction. It has been most serviceable in those cases which have never been operated upon. He does not claim that the ointment is invariably successful, nor that it forms in itself a complete method of treating lupus. It involves no pain, and requires no suspension of work or ordinary habits on the part of the patient.

URTICARIA IN INFANCY AND CHILDHOOD.

T. COLCOTT FOX in an interesting article on urticaria in infancy and childhood (*Brit. Journ. of Derm.*, May and June, 1890), with special reference to the "lichen urticatus" of Bateman, concludes that this latter affection is certainly an urticaria, and is the urticaria of infancy and childhood. It is characterized by the formation of an inflammatory lesion in the centre of the wheal, the former remaining after the subsidence of the latter; and that the inflammatory lesion is usually papular, but may be vesicular, pustular, or bullous, and that these several phases may be observed in the course of a limited number of cases. This form of urticaria very frequently precedes the operation of vaccination, in many cases follows close upon it, and in rare instances arises in the wake of varicella, measles, or scarlatina, but it bears no direct relation to these diseases. The author is of the opinion that Bateman's lichen urticatus, Hutchinson's varicella-prurigo, the infantile prurigo of other English writers, and many of the papular, vesicular and pustular rashes following vaccination, should be included as phases of one disorder, namely, the urticaria of infancy.

The affection has a very similar etiology to urticaria in the adult, and similar principles of treatment should be carried out, but in the infant the nervous system is more impressionable, the skin more susceptible, and disorder of the gastro-intestinal tract more frequent. Any influences causing irritation to the skin, such as insects or coarse clothing, or any agencies quickening the circulation through the skin, may be factors in promoting the formation of wheals, but such causes cannot be justly ascribed as the origin of urticaria. The affection in all its phases is frequently mistaken for scabies, and some vesicular cases may be confounded with varicella, and a few particular cases with smallpox. Dr. Fox thinks that further prolonged observation is necessary to determine whether this common urticaria ever terminates in Hebra's prurigo (a rare disease in England), or whether the two are wholly distinct diseases.

FRENCH DERMATOLOGY.

The last meeting of the French Society of Dermatologists and Syphilographers (*Brit. Journ. of Derm.*, May, 1890) brought forth numerous interesting observations, of which the following may be noted :

HALLOPEAU presented the case of a bullous dermatitis with permanent cicatrices, epidermic cysts, and buccal manifestations, occurring in an infant. The eruption was universal, the blebs, with clear, yellowish purulent, or sanguineous contents, appeared in successive crops, without pain, itching, or febrile reaction. The cicatrices were confluent all over the trunk, the forehead, and the greater part of the extremities. Miliary epidermic nodules of a yellowish-white color, slightly, or not at all raised, appeared in most of the old scars. Vidal, last year, published a somewhat similar case, and Besnier has observed two analogous cases, in which the epidermic cysts developed on the macules following the blebs, but there were no cicatrices.

MAURIAC presented a case of hemiatrophy of the tongue of syphilitic origin, being due probably to a central lesion.

FEULARD exhibited two cases of lichen planus of different varieties as to the skin, but showing identical lesions on the buccal mucous membranes. According to the author, the cases show the correctness of the view that the different varieties of lichen planus are only forms of one affection.

FOURNIER presented a case of syphilide of the lower lip resembling lupus erythematosus so closely that it had been treated by scarifications, until the development of a parenchymatous keratitis with iritis called attention to the true nature of the affection, which yielded promptly to antisyphilitic treatment.

MOREL-LAVALLÉE read a paper on some difficulties in the diagnosis of syphilitic chancres, *apropos* of a case in which there was no glandular enlargement, and the induration of the initial lesion seemed to develop under the cicatrix.

HALLOPEAU described an example of local asphyxia of the extremities, with chronic suppurative polydactylitis and ephemeral crops of disseminated symmetrical pustular dermatitis over the body. The general pustulation seemed to be associated with the polydactylitis, possibly depending on the absorption of a ptomaine. The pustules were extremely superficial, drying up in twenty-four hours. They also appeared on the buccal mucous membrane.

FOURNIER reported ecthyma in a child, simulating syphilitic chancre. The ulcer was situated on the buttock, and its true character perceived only when numerous similar ulcers appeared and healed under simple treatment. DU CASTEL gave the notes of two cases of atypical syphilitic chancres in which respectively thirteen and seven hard chancres appeared successively within a few days. Mauriac thought such cases not unusual, and Rollet was of the opinion that multiple chancre occurred most frequently on the breast. Fournier had seen a case in which there were twenty-four hard chancres on the two breasts.

A new mode of treating syphilis was described by QUINQUAND. 1000 grammes of calomel are rubbed up with 300 of castor oil, and mixed with 3000 grammes diachylon plaster. This mass is spread upon linen to yield 14 strips, 3 metres long by 0.20 wide each; a square of 2½ inches contains about

18 grains of calomel. A square of this size is applied in the splenic region, and renewed every 8 or 10 days. The elimination of the mercury is noticed in the urine on about the fourth day of the application. The method is clean and efficient, and the author has seen papulo-tubercular syphiloderms resolve in 8 to 15 days.

BARTHÉLEMY records the symptomatic cutaneous eruptions in epidemic influenza, which were observed fourteen times among 219 cases of the disease. The eruption may be described in general as scarlatiniform or morbilliform erythema, disappearing rapidly, as a rule, without desquamation.

ARNOZAN calls attention again to the treatment of epithelioma of the face with acetic acid, which he has employed in eight cases with excellent results. It should be employed in fifty per cent. solutions daily until the crust formed is about to come off; the applications are to be repeated, until finally a cicatrix results.

OBSTETRICS.

UNDER THE CHARGE OF

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ANTISEPSIS IN MIDWIFERY.

LUSK (*Medical News*, May 31, 1890) describes the results of his experience in the practical use of antiseptics in obstetric practice. Up to the year 1875, in New York City, there was a yearly average of $215\frac{5}{10}$ deaths from puerperal sepsis. For the five years from 1885-89, the annual average was 221. The ratio of increase in population was greatly in excess of the ratio of deaths from sepsis. The present aspect of the case may be inferred from the statement that during the past five years one-tenth of the deaths in women between the ages of fifteen and forty-five were due to causes connected with child-birth, and one-twentieth of deaths among women in the child-bearing period were due to puerperal sepsis.

The records of maternity hospitals at the present time fail to show frequent predominance of sepsis. The Emergency Hospital of New York is cited as the simplest and cheapest style of building in which cases of all sorts and in all stages of labor are confined. The mortality rate of this temporary shelter for confinement cases has been greatly reduced by the practical use of antiseptics. For external cleansing, soap and water, and 1 to 1000 bichloride of mercury are employed. For douches, 1 to 5000 solution of bichloride of mercury. For the hands and arms of the operators, bichloride 1 to 1000 is employed. Instruments are cleansed with two per cent. carbolic acid, and are frequently boiled. When intra-uterine douches are needed, they are given of bichloride 1 to 5000. No douches are given as routine treatment without positive indications.

An occlusion dressing is considered of great importance in hospital practice, and is made of some absorbent material saturated with antiseptic solution. In private practice, a healthy patient is not considered capable of auto-infection. A preliminary douche is considered advisable, and one after labor, but none subsequently in uncomplicated cases. Great attention should be paid in private houses to the sanitary conditions of patients. Pads and napkins should be destroyed, not used a second time. The lying-in room should be removed from plumbing connecting with the sewer. As a general statement, the intra-uterine douche is not indicated except where a labor has been carelessly and imperfectly conducted. Lusk prefers a bichloride solution, 1 to 3000, a quart in quantity, injected very slowly, when an intra-uterine douche is needed. Great pains are taken to secure good contractions and the expulsion of all the fluid. An iodoform suppository of two and one-half drachms is inserted in the uterus after the douche. Curetting is admissible if the symptoms of sepsis do not yield to intra-uterine disinfection.

TWO CASES OF PLACENTA PRÆVIA.

ELDERSON (*Medical Press and Circular*, May 21, 1890) reports two cases of placenta prævia in multiparæ, in whom the initial symptom was severe, and constant hæmorrhage, beginning without warning, and occurring during sleep, between the sixth and seventh month of pregnancy. In both, labor was terminated as soon as possible; the third stage was brief, and the patients recovered. In the first case, a delicate woman in her tenth pregnancy, labor ended ten days after the first hæmorrhage, by delivery with forceps. There was no hæmorrhage during or after delivery. Chloroform was administered, and as much of the placenta was separated and removed as could be easily reached by the finger. The second case was caused apparently by agitation due to a hideous dream, the patient imagining that she was attacked by the Whitechapel murderer. She awoke in a fright, in the midst of a severe hæmorrhage. So far as treatment is concerned, the writer has found separation of that portion of the placenta which is accessible by the finger to be the most practical and efficacious procedure. The portion of the placenta remaining connected has been found to be capable of supporting the child's life until labor could be terminated.

SIMPLE METHOD TO DETERMINE THE ANGLE OF PELVIC INCLINATION.

KÜSTNER (*Centralblatt für Gynäkologie*, No. 21, 1890) has found that if the patient be placed upon her back, the chest slightly raised, the thighs strongly flexed, the hands pressed firmly downward, that the promontory of the sacrum can generally be reached through the abdominal wall. A steel ruler is then slipped beneath the finger upon the promontory, its other end lying upon the symphysis. A graded scale attached to the ruler enables one to appreciate the angle of pelvic inclination.

UMBILICAL HERNIA WITH MALFORMATION OF THE LIVER.

COLLA (*Centralblatt für Gynäkologie*, No. 21, 1890) reports the case of a female child born at term, and having an umbilical hernia. It was thought

that the tumor contained intestine, but the free passage of meconium rendered this supposition improbable. Gangrene of the tumor furnished an indication for immediate operation. When the tumor was opened the contents were found to be liver-substance. Visceral and parietal peritoneum which were adherent were separated, and the contents of the tumor returned to the abdominal cavity. The child perished seven hours after operation, and post-mortem examination revealed an abnormally developed liver. The case is of interest for its rarity, and because of the unfavorable prognosis afforded by umbilical hernia when the sack contains liver-substance.

FIBRO-MYOMA AND RETROFLEXION OF THE GRAVID UTERUS.

HOOPER (*Australian Medical Journal*, No. 4, 1890) reports the case of a primipara in whom labor was delayed by a fibroid tumor. The tumor was extramural, and blocked the entrance to the pelvis, lessening its dimensions three inches. The os uteri was pulled down by a hook, and a Barnes' bag was inserted and filled with water. It was impossible to replace the retroflexed fundus, as the tumor always caught beneath the sacral promontory. During a pause in efforts at delivery the right arm prolapsed. The heart-sounds and movements of the child becoming very weak, it was determined to perform Cæsarean section. Profuse hæmorrhage followed the incision into the uterus. The child was quickly extracted, but gasped but once. The head was firmly wedged into the retroflexed portion of the uterus. The placenta was firmly adherent, and was removed with difficulty. Three fibroids were found, one of them cut through by the incision. The uterus was irrigated with hot water, and closed by continuous suture of kangaroo tendon. Neither omentum nor intestines prolapsed during the operation. It was necessary to remove a wedge-shaped piece of muscular tissue from either side of the uterine incision to enable perfect apposition over the fibroid to be made. Death from exhaustion occurred seventy hours after operation. It is probable that the malposition of the uterus was caused originally by the fibroids, exaggerated by the changes incident to pregnancy.

HYSTERIA IN THE PUERPERAL STATE.

BROUGHTON (*Boston Medical and Surgical Journal*, June 12, 1890) reports the case of a primipara aged twenty-three, whose marriage had been unhappy. After normal and easy labor, she was subjected to mental annoyances which resulted in fever and delirium. Careful examination failed to reveal an adequate cause for the high temperature, and heart-failure was the only condition threatening the patient's life. Under the use of stimulants and narcotics she improved, and, after periods of depression attended with abdominal distention, finally recovered. Her temperature was uninfluenced by antiseptic medication, and there was an entire absence of anatomical conditions to account for her condition.

Two similar cases are reported by MINOT (*Ibid.*), in whom alarming symptoms occurred without the presence of inflammation. A maniacal condition rendered treatment almost impossible, and both cases recovered gradually, being able to take nourishment freely in spite of severe symptoms.

In discussion upon these cases, GREEN reported four cases in whom the same symptoms had been present, and in whom recovery had finally ensued. In some of the cases, the cause for delusions and hallucinations could be found; in others, such was not the case. In one, the temperature remained subnormal for some time. To these cases PRINCE added another, in whom the rise of temperature followed conversation of an exciting nature a few days prior to delivery. These and other recorded cases prove that all the phenomena of hysteria may occur in the puerperal state, and simulate septic absorption, collapse, and shock following hæmorrhage, and also acute mania.

A CASE OF SPONTANEOUS VERSION.

BENNETT (*Lancet*, June 7, 1890) reports a case of spontaneous version in arm presentation in a primipara aged twenty-six. The presentation was left dorso-anterior. Efforts at version failing, assistance was summoned to perform embryotomy, but during the interval spontaneous version occurred, and the fœtus was expelled in breech-presentation.

FACIAL PARALYSIS FOLLOWING THE USE OF FORCEPS.

RENBOLL (*Ibid.*) reports the case of a patient with symmetrically contracted pelvis, in whom the forceps was applied at the brim of the pelvis. The child was born with paralysis of the left facial nerve and its branches. The pressure of the forceps, however, was on the side opposite to the paralysis. Recovery followed.

DOUBLE TRANSVERSE POSITION IN TWIN-PREGNANCY WITH PROLAPSE OF THE CORD.

ROESGER (*Centralblatt für Gynäkologie*, No. 22, 1890) reports the case of a multipara to whom he was summoned early in labor. The uterus was greatly distended, palpation gave indefinite results, and auscultation failed to reveal the heart-sounds. The cord had prolapsed, the membranes were protruding, and the pelvis was found on examination to be filled by fœtal limbs. After some difficulty had been experienced in introducing the hand, the first child was turned without rupturing the membranes, and when the feet had been grasped, the membranes were ruptured, and the child delivered. The second child presented again in transverse position, and version was again made, and the child delivered. The placenta was a simple one with double membranes, and was easily removed. The double transverse position is rare, having been estimated as occurring in 0.47 of all twin pregnancies.

PUERPERAL TETANUS.

MARKUS (*Pöyger medicinische Wochenschrift*, No. 21, 1890) describes the case of a multipara aged thirty-eight, who was delivered of twins after an easy labor, the placenta remaining behind. The patient was taken to a hospital four hours after delivery, and the placenta was expelled. The patient was taken home by her husband three days after confinement, as recovered. Nine days after delivery she was suddenly taken with trismus, and brought

back to the hospital. On examination, the uterus was found just above the symphysis, no tenderness or inflammation about the uterus, and no discharge. Involution had gone on poorly, but otherwise no cause could be found in the pelvic organs for the disease. Albumin was found in the urine on examination. Liquid diet was prescribed, with stimulants as needed. The next day the patient's symptoms grew worse, and death ensued from œdema of the lungs on the evening of the eleventh day after confinement. Post-mortem examination revealed the endometrium in a condition of necrosis; the muscular tissue of the uterus soft, and easily torn apart. In the veins of the right ovarian plexus thrombi had formed, some of which had been separated and carried into the circulation. The spleen was increased one-half, its capsule thickened, and its parenchyma engorged. Inoculation of rabbits with material taken from the subdural spaces of the brain was without result. A diagnosis of necrotic endometritis and septicæmia was made. The cause of the tetanus was thought to have been ptomaines and bacilli formed in the necrotic tissue of the endometrium.

A CASE OF SYPHILIS OF THE PLACENTA.

RIVET (*Journal de Médecine de Paris*, No. 21, 1890) has observed a case of a woman who became infected with specific infection two years before the birth of her first child. Following this she had a miscarriage at six months, and after this a second child was still-born at the normal period of gestation. The patient's next pregnancy went on to eight months and a half, and she sent for her physician, stating that foetal movements had become very feeble. On the evening of the same day they ceased to be felt, and the death of the foetus was diagnosed. Nine days afterward the patient gave birth to a still-born, macerated child. Post-mortem examination of the infant revealed no organic lesions. The placenta presented no macroscopic changes; microscopic examination, however, demonstrated that the placental tissue was friable and broken down, and the arteries of the placenta and cord were in a condition of endarteritis. The diagnosis was made of placental syphilis, and death of the foetus from impaired circulation caused by specific endarteritis.

FIBROID TUMORS OF THE UTERUS COMPLICATING PREGNANCY.

POZZI (*Gazette Médicale de Paris*, No. 21, 1890) gives a summary of the results of treatment from operative procedures in these cases. In general, he finds a maternal mortality of fifty-three per cent. and foetal mortality of thirty per cent. as the usual result of this complication. An examination of the cases in which simple myomectomy has been done, and the uterus has been left after the operation, reveals a considerable number of cases in which recovery has taken place. Amputation of the uterus gives, on the whole, considerably better results than the more conservative operation.

DYSTOCIA FROM CLOSURE OF THE EXTERNAL OS. WITH ELONGATION OF THE CERVICAL CANAL.

JENTZER (*Archive de Tocologie*, No. 5, 1890) reports the case of a woman, aged twenty-two, in labor at term, who gave no history of previous injury or

inflammatory disorder. Labor not proceeding under the care of a midwife, a physician was summoned. On examination, a tumor was found the size of a child's head, projecting between the thighs. Closer examination revealed the fact that it was the head of the child, covered by an elongated and almost impervious cervix uteri. Counter-pressure was made by the midwife in attendance, and the cervix was gradually dilated and the child removed. It had been dead some hours. The patient subsequently made a good recovery, and the most careful examination failed to reveal any history of previous prolapse or disorder such as might cause this complication at labor. An examination of the literature of the subject reveals several similar cases.

REPEATED TUBAL PREGNANCY.

To the list of these cases already reported by Olshausen, Veit, Winckel, and others, FROMMEL (*Deutsche medicinische Wochenschrift*, No. 23, 1890) adds that of a woman, aged thirty-three, from whom he had removed a tubal gestation upon the right side, ten days after the death of the fœtus. The placenta was removed gradually, and the sac closed by granulation. The patient made a complete recovery, and four years afterward complained of pain in the left side of the abdomen. Eight weeks after the cessation of menstruation the patient collapsed upon the street, with intense pain and symptoms of internal hæmorrhage. The expulsion of decidua followed, and the patient made a tedious recovery. Pelvic hæmatocele occurred, which varied in size, but was finally largely absorbed.

A CASE OF METASTATIC OPHTHALMIA IN THE PUERPERAL STATE, CAUSED BY STREPTOCOCCUS EMBOLISM.

VOSSIUS describes very minutely (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xviii. Heft 2) the case of a multipara, aged thirty-nine, who had contracted pelvis. She was delivered after a difficult version of a maccrated child. Septic infection occurred, and the patient died six days afterward of pyæmia. The third day after delivery she became blind in one eye, and examination with the ophthalmoscope revealed iritis and general septic ophthalmia. On post-mortem examination, a general pyæmic infection was found, and the eye was removed for microscopic examination. When hardened and cut in sections, the retina was especially affected, the capsule of the lens had ruptured, the lens was dislocated, and the vessels of the eye were filled with masses of streptococci. The sheath of the optic nerve and the blood-vessels about it had escaped invasion, but the other tissues of the eye swarmed with the bacteria; the retina had been one of the first tissues attacked, as was noticed by the early appearance of total blindness. A similar case has been well described by Wagenmann in *Gräfe's Archiv*, Band xxxiii. Heft 2. This is one of the infrequent and interesting complications of puerperal pyæmia.

TWO CASES OF EXTRA-UTERINE PREGNANCY TREATED BY LAPAROTOMY.

BRAUN-FERNWALD (*Archiv für Gynäkologie*, Band xxxvii. Heft 2) reports two cases of extra-uterine pregnancy in which the child was living at the

time of operation. In the first case, after the delivery of the child by laparotomy, the placenta was immediately removed. Severe hæmorrhage followed, and an effort was then made to ligate the vessels which led to the placental site. The patient, however, lost so much blood that death followed shortly after the operation. On post-mortem examination it was found that the blood-vessels supplying the tissues at the placental site, ran from the wall of the uterus parallel with the tube directly to the placental site. In the second case, the sac had ruptured, and the abdomen contained amniotic fluid. The child was at term, living, and lay free in the abdominal cavity. After its removal by laparotomy, the vessels leading to the placenta were ligated before its removal. The uterus was brought up into the abdominal incision, and amputated at the cervix, and the stump was treated by the extra-peritoneal method. The foetal sac was drained, the child, which was born asphyxiated, was revived, but died subsequently of inspiration pneumonia. The mother made a good recovery. Attention is drawn to the contrast between the two methods of treating the placental site in these cases, and the fact is urged upon operators that it is necessary to ligate the vessels before removing the placenta, rather than after it has been separated from its attachment.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

STATISTICS OF OVARIOTOMY.

FR. TERRILLON (*Le Mercredi Médical*, July 2, 1890) reports two hundred cases of ovariectomy, with twelve deaths in the first hundred and four in the second, three of the latter being due to shock and only one to sepsis. The writer argues in favor of sparing the remaining ovary when it is not visibly diseased, since nine of the patients thus treated subsequently bore children.

PREGNANCY FOLLOWING LAPARO-MYOMOTOMY.

KRÖNLEIN showed at a recent meeting of the *Versammlung des ärztlichen Centralvereins* at Zürich a young woman upon whom he had performed laparotomy with extensive resection of the corpus uteri for myofibroma. Contrary to the usual custom he had spared the adnexa. The patient subsequently became pregnant and was delivered after a normal labor.

ELECTRICITY AS APPLIED TO GYNECOLOGY.

MASSEN (*Journ. accouch. i Jensk. bol. ; Gazette de Gynécologie*) reports the results of his experience with Apostoli's method in Slaviansky's clinic. He

introduces a speculum during the *séance*, claiming that he can in this way study the changes in the cervix and the character of the discharge during the passage of the current. He believes that it has a catalytic rather than an electrolytic action, influencing the circulation through the vasomotor nerves. He reports seventy-two cases of fibroid tumor, endometritis and diseases of the adnexa, thirty-four patients having been discharged as positively benefited, while nineteen were still under treatment. The writer believes that the method of Apostoli, though still empirical, has an assured future, especially as an efficient means of checking uterine hæmorrhage, and should always be given a fair trial before resorting to castration.

VAGINAL HYSTERECTOMY.

OTT (*Frauenärzt*, June, 1890) reports eleven cases in which total extirpation was attempted, the operation being abandoned in three cases on account of the extension of the disease to the peri-uterine tissues. All the other eight patients recovered, but six had a recurrence within less than a year.

VAGINAL EXTIRPATION OF THE UTERUS.

MALAN (*British Gynecological Journal*, May, 1890) believes that the operation should be judged by the results obtained by the best operators. Leopold's statistics show only four deaths in eighty cases, or 5 per cent., and perhaps even this death-rate may be diminished. Forty-two cases had been operated upon more than two years before, of whom twenty-seven, or 64½ per cent., were still free from recurrence. The writer opposes high amputation, first because the mortality is greater [?] than after total extirpation, and secondly, because it is impossible to say beforehand how high the disease extends. Infiltration of the broad ligaments is not in itself a contra-indication to the radical operation, since it may be purely inflammatory and not cancerous. "As long as the uterus can be drawn down, so long is the operation allowable." The condition of the patients with recurrence of the disease after hysterectomy is not materially worse and does not constitute an argument against the operation in suitable cases.

THE SURGICAL TREATMENT OF CANCER OF THE UTERUS.

PETROW's thesis on this subject (abstracted in *Frauenärzt* for June, 1890) is based upon observations made in Lebedev's clinic. The latter performed twelve vaginal hysterectomies with two deaths; two patients had a recurrence within less than a year and only one was free from disease at the end of three years. Of seven patients upon whom high amputation was done, two had a recurrence within eight months, one was healthy at the end of two and one-half years, and four had not reported.

The writer collected from all sources 599 cases of total extirpation and 417 of high amputation, the immediate mortality in the first series being 18.76 per cent., in the second 8.7 per cent. In 21 per cent. of the cases of total extirpation the average freedom from recurrence was only eight months, although the subsequent history of nearly one-third of the patients was not

obtained. Over one-half of the cases of high amputation were lost sight of, but there was a return of the disease in 38 per cent. of the others. From these statistics the writer argues in favor of vaginal hysterectomy. [As the author himself admits, these statistics are unreliable, especially as regards the recurrence after high amputation. There is, however, no question as to the relative mortality following the two operations.]

THE SURGICAL TREATMENT OF CANCER OF THE UTERUS.

JESSETT (*British Gynecological Journal*, May, 1890), as the result of his long experience at the Brompton Cancer Hospital, arrives at the following conclusions:

1. When the disease is confined to the portio vaginalis, amputation of the cervix is the operation to be performed, the scissors, rather than the cautery or écraseur, being preferable.

2. Caustics are "unreliable, and, indeed, in many cases, harmful."

3. If the disease does not extend beyond the os internum, conical amputation should be practised; but if it is found to extend higher, the entire uterus may be extirpated.

4. If the disease is limited to the corpus uteri and is recognized early, vaginal hysterectomy is the only operation to be done.

5. "No drugs administered internally have any effect whatever in arresting the disease."

Appended to the paper is a table showing the results in eight cases of high amputation, but both these statistics and those of the writer in vaginal hysterectomy are of little value except as they present the immediate results of both operations, which were good, the mortality being *nil*.

THE LIMITS OF VAGINAL HYSTERECTOMY FOR CANCER OF THE UTERUS.

COE (*Am. Journ. of Obstetrics*, June, 1890), from a study of nineteen cases of vaginal hysterectomy, arrives at the conclusion that when performed in cases of cancer of the cervix the operation can seldom be regarded as a curative one, though the immediate mortality may, in the hands of experienced operators, be reduced to six or eight per cent. He would limit total extirpation to cases of malignant disease of the corpus uteri in which the condition is recognized early, while the uterus is freely movable, the glands and perimetric tissues are not involved, and the patient's general health is such as to offer a fair prospect of recovery from the operation and the enjoyment of several years of life. But even under these circumstances the surgeon may be disappointed by an early recurrence.

THE TREATMENT OF CYSTITIS IN WOMEN.

MORE MADDEN read a paper before the present International Medical Congress in which he states that no method of treating this affection hitherto employed has secured absolute physiological rest of the bladder. Emmet's operation, of establishing an artificial vesico-vaginal fistula, is open to several objections, though it is successful in some cases. The writer has, for several years, practised the following method: The urethra is first thoroughly

dilated with a specially devised instrument until the sphincter vesicæ is paralyzed, temporary incontinence being produced; glycerite of carbolic acid is then applied directly to the diseased mucosa, pain being prevented by a previous application of cocaine. One or two applications, at intervals of a week or ten days, is sufficient. In any ordinary case of cystitis the cure is rapid.

VAGINAL HYSTEROPEXY FOR THE CURE OF RETROFLEXION OF THE UTERUS.

HARTMANN (*Annales de Gynécologie et d'Obstétrique*, June, 1890) criticises Schücking's operation for retroflexion as based on an anatomical error—*i. e.*, that there is an actual space between the bladder and the anterior wall of the vagina and uterus, whereas no such separation exists "except in his (Schücking's) imagination." There is not only danger of injuring the bladder, but a loop of intestine might be perforated, while there is danger of infecting the peritoneum if the uterine cavity is not absolutely aseptic. The writer commends the following operation designed by Nicolétis and improved by Richelot, based upon the anatomical fact that at the junction of the cervix and vaginal fornix there is a fibro-muscular ring which has considerable to do with maintaining the uterus in its normal position. High amputation of the cervix is first performed in the usual manner, after separation of the vagina, the wedge-shaped incision being carried up nearly as high as the angle of flexion. The mucous membrane of the uterus is sutured to the posterior edge of the vaginal wound, then a suture is passed through the lateral edge on each side and is carried into the muscular substance of the uterus, emerging at the anterior edge of the raw surface. When the two latter sutures are tightened, the uterus is drawn forward and maintained in a position of anteversion. Additional sutures are employed to completely cover the stump. As the writer admits, this operation is rather to be regarded as a secondary procedure in cases in which hypertrophy of the cervix coexists with retro-deviation, and can only be employed when the uterus is freely movable; moreover, in order that it may be successful it is necessary that the pelvic floor should be intact, and that there should be no tendency to prolapse.

MENSTRUATION AND THE REMOVAL OF BOTH OVARIES.

ENGELMANN (*Trans. Southern Surgical and Gynecological Association*, 1889) concludes an interesting clinical paper on this subject with the following deductions: The persistence of menstruation after the removal of both ovaries is due to remains of ovarian tissue that have been left, perhaps in an elongated pedicle; such remnants, however, do not necessarily preserve their vitality and functional activity. It follows that menstruation and healthy ovarian activity are inseparable. The surgeon who aims to induce the menopause by extirpating the ovaries cannot expect to accomplish this result with certainty unless every bit of ovarian stroma is removed. In performing double ovariectomy in women who have not passed the climacteric, and do not suffer from uterine reflexes, the operator should spare any healthy ovarian tissue in order that functional activity may be preserved.

INFLAMMATION OF THE OVARIES.

SLAVIANSKY'S most recent paper on chronic oöphoritis (*Annales de Gynécologie et d'Obstétrique*, June, 1890) contains essentially the same views which he has previously expressed. Localized pain is the most prominent symptom; this is not increased by deep pressure in the cirrhotic form of the disease. The pain in these cases may be due to the compression of terminal nerve-fibre by the cicatricial tissue. Hyperæsthesia of the skin supplied by the genito-crural nerve is often noted, especially just before menstruation. The character of the menstrual flow depends upon the amount of ovarian tissue affected; menorrhagia is most common in connection with hyperplastic oöphoritis associated with endometritis. Complete amenorrhœa is comparatively rare. Sterility is a rare result of chronic inflammation of the ovaries; it is most apt to follow that form of acute parenchymatous oöphoritis which accompanies certain febrile diseases. Among the reflex neuralgias, pains in the sixth and seventh pairs of intercostal nerves, on the side corresponding to the affected ovary, are quite common. Migraine, palpitation, reflex cough, and gastric irritability are well-recognized phenomena. Contrary to the usual view, hysteria is very rare in patients with chronic oöphoritis.

The writer has considerable faith in medication, especially in iodide of potassium, which he uses in the form of vaginal suppositories. Hot douches and pelvic massage are useful, especially the latter. Menorrhagia should be treated by curetting the endometrium, an operation which not only does not affect injuriously the diseased ovary, but often causes an improvement in its condition. Intra-uterine galvanization is equally efficient as a hæmostatic. Oöphorectomy is to be considered only after all other means of relief have been faithfully tried. The writer is opposed to an early resort to the operation, having frequently observed cases in which patients who had been told that there was no relief for them except by laparotomy, were cured without it.

CYSTOPENY.*

Under this term TUFFIEN (*Le Mercier Medical*, July 2, 1890) describes an ingenious operation for the cure of cystocele which is based upon the same principle as the Alexander-Adams operation. He first experimented upon dogs, opening the abdomen, denuding corresponding surfaces on the anterior wall of the bladder and the abdominal wall, and uniting them by sutures. Union readily took place, without causing vesical irritability by reason of traction on the neck of the bladder or ureters. No diminution in the capacity of the organ was noted in consequence of the necessary change in its shape; its adhesion did not prevent it from distending sufficiently. The lateral ligaments of the bladder in the human subject being too slight to afford any support, it occurred to him that this might be obtained by shortening the urachus, which was practised successfully in the cadaver. He had performed the operation twice on the living.

The details in the second case were as follows: Under strict antiseptic precautions an incision was made, as in suprapubic cystotomy. The peritoneum was stripped from the lateral walls of the bladder until the vagina was reached; this procedure was facilitated by pushing up the vagina from below.

In order to avoid the ureters, a point was then selected on each side an inch above the vaginal fornix. On making upward traction upon the bladder at these points the cystocele was completely reduced. The organ was then fixed in its new position by passing four silk sutures on each side through the wall of the bladder and the raw surface on the anterior abdominal wall. After closing the incision, the vagina was tamponed with iodoform gauze, and the urine was withdrawn by catheter for a week, the tampon being renewed at intervals for two weeks, when the patient was allowed to leave her bed. One patient has been under observation for a year and a half without having a recurrence of the cystocele.

PÆDIATRICS.

UNDER THE CHARGE OF
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TREATMENT OF GROUPO-DIPHTHERITIC LARYNGEAL STENOSIS BY INTUBATION.

GANGHOFNER (*Jahrb. f. Kinderh.*, xxx. 3, and *Med. Monats.*). During a period of eight months 105 cases of diphtheritic stenosis came under the author's observation. Of these, 18 recovered spontaneously. Of the remaining 87, in 42 intubation was performed, and in 45 primary tracheotomy. Of those who were intubated 17 were under two and a half years of age, 19 under four, 4 under six, and 2 over six. Of 41 cases in which the result was known, there was recovery in 8. Of the 45 in which tracheotomy was performed, the youngest was eleven months old, the oldest eight years. Only 4 of the 45 recovered. Of the 42 cases of intubation, tracheotomy was subsequently required in 21, and death ensued in all. It is evident that intubation had nothing to do with the high mortality in this series of cases, but that the character of the epidemic was very destructive. The combination of the cases of intubation of Guyer, Ranke, and Ganghofner, 112 in all, showed 31 recoveries, that is, 27.6 per cent. The statistics of Dillon Brown show 27.3 per cent. of recoveries. It is, therefore, concluded that intubation deserves full recognition, as compared with tracheotomy, and its further trial on a very large scale is justifiable. Especially does this remark apply to the diphtheria wards of hospitals.

MULTIPLE ABSCESSSES IN NURSING-INFANTS.

COUDER (*Le Concours*, April 12, 1890). It is not always easy to determine the cause of multiple abscesses in very young infants. In many cases tuberculosis is the cause. In others, there is gradual inoculation of pus from a pri-

mary eczematous accumulation. Certain cases may be attributable to puerperal pyæmia, in which the umbilical wound is the seat of entrance. In others, according to Budin, there is no erosion of the external covering, and pyogenic microbes probably enter by way of the mother or nurse, who may be suffering from inflammation of the galactophorous ducts. Galactophoritis should, therefore, be considered in the course of an examination, and if it is found lactation should be suspended, for milk which is charged with pyogenic microbes as it traverses the excretory canals will communicate pyæmia to the infant.

A CASE OF MULTIPLE TUBERCULAR TUMORS IN THE BRAIN OF A CHILD AGED SEVEN AND A HALF MONTHS.

HENOCH states that among fourteen of his cases "there were twelve between nine months and two years of age," and he points out that "the assertion of Rilliet and Barthez that this disease is never observed before the third year, is to be explained by the circumstance that these authors only saw children over two years of age in their hospital." Ashby and Wright, in their section on tumors of the brain, write as follows: "No age is exempt; tubercular tumors have been found in infants a few months old, though they are more common somewhat later." Eustace Smith, referring to the opinion already noted that cerebral tuberculosis is rare under two years of age, states his belief that "the occurrence of the disease in infants is more common than has been supposed;" and he supports his opinion by recording two cases in which tubercular tumors were found post-mortem, at the ages of twelve and six months respectively. Baginsky, while acknowledging that the rule is to find the disease during childhood, refers to three of his own cases, in which the ages were seven, eleven, and eighteen months respectively, the two latter having been verified by post-mortem examination. Steffen, of Stettin, in discussing the age at which cerebral tumor is likely to occur, remarks that during the first year of life the number of cases is generally small, and confined, with the exception of a few cases of sarcoma, to tubercle. Most writers on cerebral tuberculosis make mention of the remarkable case recorded by Demme, in which a tumor the size of a hazel-nut was found in the brain of an infant aged twenty-three days, whose mother suffered from tuberculosis. In this case the disease must have commenced during intra-uterine life.

J. McN. was born, of healthy parents, on March 26, 1889, and was to all appearances a perfectly healthy child. She became plump and strong, and continued to thrive until she was about five months old. About this time she was pitched out of her cradle by an older child and fell on her head, but her mother declares that it was not a severe fall, nor did she cry much in consequence. Three weeks later it was observed that there was something wrong with the child; she seemed dull, heavy, and listless. The right side of her face was quite expressionless. There was occasional nystagmus and squinting. The right pupil was distinctly smaller than the left, but contracted equally with the other on exposure to light. For several days previously she had been observed to put her hand to her right ear, and was inclined to rub that side of her head against the shoulder of anyone who held her. For some days

afterward she remained in very much the same condition, only that she seemed to suffer more pain than before, especially in the neighborhood of the right ear. As the pain increased daily, and as the membrana tympani was very red and inflamed, the drum was punctured, but nothing save a few drops of blood came. The puncture appeared to give some relief, however, but only temporarily; the child did not cry so constantly or so piteously as before. About this time paralysis of the orbicularis came on, so that the right eye remained permanently open. The left arm and left leg would at one time hang quite limp and apparently paralyzed, and at another become rigid. The anterior fontanelle was slightly depressed at first, but latterly the depression became very marked.

Death took place on November 9, 1889.

Post-mortem Examination.—The body was much wasted, and presented the usual appearances of infantile atrophy. The dura mater was firmly adherent to the internal surface of the calvarium. The cerebral tissue was somewhat soft, and the surface of the convolutions was rather intensely injected. On removing the brain, it was found to be the seat of multiple caseous formations, which, in some instances, had broken down into a greenish granular semifluid material. The tubercular nodules, which varied in size from a small pea to a large hazel-nut, were found chiefly in the following situations: 1. In the pons Varolii two nodules, one on either side of the middle line, that on the right side being the larger of the two. 2. A nodule about the size of a split pea in the left lobe of the cerebellum on its under surface. 3. A nodule the size of a hazel-nut in the upper and anterior portion of the cerebellum, where it formed the anterior extremity of the roof of the fourth ventricle. 4. Nodules, each not less in size than hazel-nuts, were also found in the left optic thalamus, and in the floor of the fourth ventricle. Several very small nodules were also found in different parts of the cerebrum, there being no fewer than six tumors of considerable dimensions, as detailed above. The lateral ventricles were much distended, and contained a large quantity of clear fluid, which escaped during removal of the brain. The membranes and vessels at the base of the brain were normal. The lungs, with the exception of one point at the junction of the upper and middle lobes of the right, were quite non-adherent. At this point, however, a caseous ragged cavity, capable of holding a small walnut, was opened into. The lungs generally were beset with small, opaque, hard, caseous tubercles, which were easily felt projecting through the pleural surface, and which presented all the characters of chronic military tuberculosis. The lymphatic glands surrounding the bifurcation of the trachea were found to be much enlarged and extensively caseous. Some of them were very intimately related to the walls of the great veins of the region. Under the microscope the usual appearances of caseous tubercle were discovered, with here and there traces of commencing calcareous infiltration. The heart presented a normal appearance. The liver, kidneys, and spleen, on being removed from the body, were found to have healthy naked-eye characters. On microscopic examination, however, a few military tubercles were found in the kidneys, and the liver was seen to be the seat of a moderate fatty infiltration.

In the fresh state, a scraping from one of the caseous nodules in the lungs was subjected to the Ziehl-Neelsen method, and, on examining the specimen,

large numbers of tubercle bacilli were found. After careful hardening in alcohol, microscopic sections of one of the nodules in the pons Varolii were likewise subjected to the Ziehl-Neelsen method. On examining a number of the sections so treated the tissue was found to be teeming with most typical tubercle bacilli.

In a child predisposed to tuberculosis (in that state of constitution favorable to the reception and growth of tubercle bacilli) the fall may have caused punctiform lacerations or bruises of the cerebral tissue, in which bacilli, carried by the blood, might settle and thrive, owing to the diminished resisting power of the injured parts.

In the present case there were localizing symptoms, although no doubt they were somewhat confusing, and so the case is an exception to what Henschel believes to be the rule, namely, that multiple tubercle is far more subject to latency than the solitary form.

The bronchial glands were the seat of advanced tubercular disease, and it is extremely probable that here we have the starting-point of the whole series of tubercular changes found in the case. Under these circumstances we are justified in concluding that the accident of a fall upon the head, which the child sustained, determined the development of the tubercular tumors in the brain; and that in a large number of cases of cerebral tubercle, a similar succession of events will be found. Support is given to this opinion by an examination of thirteen cases recorded by Henschel. In eight of these thirteen cases there were well-marked tubercular changes in other organs besides the brain, and in four of the eight cases the bronchial glands are described as caseous. In five out of the thirteen cases the condition of other organs as regards tubercle is not mentioned, although it does not of necessity follow from this that the tubercle was solely confined to the brain. From a nosological point of view it follows, therefore, that in a considerable number of cases cerebral tubercle cannot be classified as a primary disease of the brain, and that its clinical significance is entirely subordinate to that of the general tubercular state.—*British Medical Journal*, May 31, 1890.

PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,
OF LONDON.

THE ITALIAN PUBLIC HEALTH ACT, 1888.

On December 22, 1888, the "Legge per la tutela della igiene e della sanità pubblica" received the royal assent, and since the first day of the present year its provisions have come into full operation, so far as existing circumstances permit. Europe, indeed the entire civilized world, will watch with

interest the results and practical working of a law which is a masterpiece of comprehensive and scientific legislation, worthy of the sons of forefathers whose jurisprudence was the foundation of the civil law, and is still studied by the jurists of every country.

Like all Italian statute laws, the Act itself is remarkably concise, dealing with principles rather than details, these being provided for in a supplementary "royal decree," or, as we should say, an "order in council." The Act is, therefore, an outline, the details of which may be to a great extent modified from time to time, as experience or circumstances may suggest, without the repeal of a single clause, and without the cost and confusion inseparable from subsequent "amendment acts."

The provisions of the bill having been carefully considered by the ministers, and in a select committee of Parliament, as well as by the Royal Society of Hygiene, in their annual congress at Bologna, and passed with no material alterations by the Senate, Signor Crispi, unwilling to imperil its passage through the lower house during the current session, resolutely refused to admit of further amendments, insisting on its acceptance or rejection *in toto*. That it passed by an overwhelming majority will not surprise those who know the absence of factious opposition and of obstruction, on purely party grounds, that marks the reception of measures of a non-political character in the Italian Parliament.

Two ideas, which British legislators have hitherto entirely failed to grasp, pervade the whole scheme. First, that important as sanitation undoubtedly is, it is not all that is implied in the care of the public health, but that medical relief of the poor, diseases of domestic animals, water supply, and the adulteration of food, etc., the hygienic aspects of industrial, manufacturing, and agricultural operations, the drainage of lands and conservancy of rivers, the health of the army, navy, and mercantile marine, provision for burials, the registration of births, deaths, and marriages, and the regulation of the medical, pharmaceutical, and allied professions, with other matters usually dealt with by separate acts and authorities, are but parts, coördinate and mutually connected, of one great department of social legislation and economy.

Secondly, that these demand special knowledge, not only in the executive or officials of the sanitary service, but not less so in the administrative, and that, consequently, the control of the public health cannot safely be entrusted to boards elected by popular suffrage, on other issues than those of special competency; in other words, that the sanitary councils or boards of health must be distinct from the local authorities, be composed exclusively of experts in the several branches of the work, and be appointed by an independent authority—i. e., directly or indirectly by the Crown, so as to be themselves uninfluenced by the fear or favor of the ratepayers, and of the public over whose interests they have to watch.

The main characteristics of the Act are, therefore, the recognition of the wide scope and mutual bearings of the questions involved, and of the necessity of both scientific acquirements and independence, alike in the administrative and the executive departments; and the happy balance maintained between the rival claims of local self-government and of control by the central authority, with a corresponding apportionment of the fiscal burdens.

The administration of the law devolves on the Minister of the Interior,

the prefects and sub-prefects of the provinces, and the syndics of towns and communes, the latter officials being elective, and the former appointed by the Crown. The provinces, sixty-nine in number, have populations varying between 100,000 and 1,200,000, corresponding thus to English counties. The Minister is advised by a Superior Board of Health, the members of which are appointed for life, and debarred from private professional practice. The prefects in like manner by provincial boards, the members being appointed by the Crown, for periods of three years, but eligible for reappointment, and permitted to engage in practice, receiving fees for attendance at the meetings.

The boards, superior and provincial, are composed exclusively of experts, the provincial of two to four physicians and one to three engineers, with a chemist, a pharmacist, a veterinary surgeon, a lawyer, and one member conversant with administrative business; the Superior Board is constituted in like manner, though somewhat more numerous, and has a number of *ex-officio* members, representing the several departments of the State and the public services concerned in the administration of the Act.

In each province is a "provincial medical officer," appointed for life by the Crown on the recommendation of the Superior Council, with one or more divisional officers in the largest provinces, and others in the chief cities of the kingdom. One-sixth of these appointments have, in the first instance, been conferred on eminent hygienists, but, for the rest, competitive examination is required, in addition to certificates of having passed with credit a course of instruction in hygiene and laboratory work. These officers are divided into three classes, and promoted by merit as well as seniority. There is also a provincial veterinary officer or inspector, on whom devolves the systematic supervision of all dairy and grazing farms, horses and cattle, slaughter-houses, and places for the sale of meat or milk, in which duties he is assisted by local inspectors. He takes cognizance of the health and sanitary surroundings of the animals themselves, while in England it must be shown that the stall or sty is a nuisance to other persons than the owners, or that the animal is at the time on sale for human food.

In each commune a medical man, practising and residing in the district, is selected on the ground of competence by the provincial board to act as health officer of the commune. These appointments are open to revision every three years, and cannot be conferred, except provisionally, on men who have not undergone a course of practical instruction in hygiene. The powers of the communal medical officers are limited to advising the local authorities, and furnishing information to the provincial medical officer.

The law on the sale of adulterated or damaged food, drugs, etc., including, as in Germany, Austria, Denmark, and Sweden, the use of poisonous materials in wall-papers, toys, and all articles of domestic use, of which the English law takes no cognizance, is very, though not too severe. The entire stock of the article impugned is confiscated, and a second conviction involves imprisonment as well as fine. Instead, too, of our haphazard way of trying to catch the petty dealer unawares, the medical officer may at any time deliberately inspect the whole stock in such shops and manufactories, with, if he wish, the assistance of a chemist. As regards pharmaceutical establishments, this inspection is obligatory at least once a year.

No one is allowed to practise as a medical man, dentist, veterinary surgeon, midwife, or pharmacist, unless holding a legally recognized diploma, while medical practice and pharmacy are absolutely dissociated. Under no circumstances whatever may a medical man dispense; and this is not felt as a hardship, for the profession itself insisted on the withdrawal of a saving clause in favor of men practising in rural districts, for which one had to be substituted permitting the local authorities where, and *and so long only* as there should be no pharmacy within a practical distance, to provide their medical officer with drugs for the exclusive use of his pauper patients. On the other hand, the pharmacist, while enjoying his legitimate monopoly, incurs the heaviest penalties by exceeding or abusing his privileges. Excepting a certain number of official and other preparations specially scheduled by the Council, the pharmacist must not supply any remedies in a condition, or with directions for internal or external use, without the written order of a medical practitioner. Proprietary medicines, unless their composition be known and approved by the Council, are thus *de facto* illegal.

Notification of infectious diseases is compulsory, the certificate being sent, with remarks as to the sanitary surroundings, or probable source of the infection, to the Provincial Medical Officer; and all certificates of the cause of death are forwarded by the medical attendant to the Syndic, not given to the friends.

There are many other provisions in the Act well worthy of imitation, apart from the completeness and harmony of the entire scheme; and to those who may be inclined to object that the code is Utopian, and that it is inexpedient if not dangerous to legislate in advance of public opinion, the best answer is that which Prof. Ruata gave to an eminent statesman in connection with this very question:

"A well-conceived law may impart a greater impulse to public opinion in the course of two or three years, than it would have received from the spontaneous progress of enlightenment in a whole generation."

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OCTOBER, 1890.

VARICOSE ANEURISMS OF THE AORTA AND SUPERIOR VENA
CAVA.¹

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THERE is, perhaps, no pathological condition whose symptoms are usually more characteristic than are those of obstruction to the normal flow of blood in the superior vena cava. Such a condition may be brought about by compression by tumors or aneurisms, by inflammation and consequent thrombosis of the vein itself, by rupture of an aneurism of the aorta into the vena cava, by penetration of a malignant growth into the vessel, or by bands of inflammatory tissue constricting it from without.

The characteristic symptoms consist in intense œdema and cyanosis coming on rapidly or slowly, and limited to the upper half of the body; together with such secondary symptoms as would naturally follow these conditions. It is difficult to conceive of any cause suddenly operating to bring about obstruction, yet failing to produce these effects. Only when the cause operates very slowly does it seem possible that the symptoms may be slight, or even absent, the collateral circulation having become established.

Rupture of an aneurism of the arch of the aorta into the superior vena cava, one of the causes referred to, is so rare an occurrence that we have

¹ Read before the Association of American Physicians, May, 1890.
VOL. 100, NO. 4.—OCTOBER, 1890.

been interested in looking into the history of the affection, in connection with a case occurring under our own observation, with the hope of determining whether there exist any symptoms which would permit of a diagnosis during life.

The following history of the case is imperfect in some points, owing to the patient's slight knowledge of English, as well as to the difficulty which he experienced in talking on account of the great dyspnoea from which he suffered:

Tak Sing, Chinaman, aged forty-eight years. Was admitted to the Hospital of the University of Pennsylvania, September 22, 1888. His parents are both dead, of causes unknown. Nothing else can be elicited in the way of family history. He has been a cook on a man-of-war, and since 1876 has been working in a laundry. Although on close questioning he says he has noticed numerous small varicose veins over his thorax for four months, he claims that he has always been a healthy man until four weeks ago. At this time he had been working very hard in his laundry, and sleeping in a cold, damp cellar for several nights, after which he was attacked by a severe pain in the chest, which prevented him from sleeping. He was also unable to lie down at night, presumably from dyspnoea. He noticed that his neck and shoulders were swelling, the left side being more swollen than the right. After this the chest became swollen, and he says that his feet were so likewise. The notes of the case make no reference to the condition of the arms. It could not be positively determined whether oedema first appeared at this time, or whether some had existed four months before, at the time the varicose veins of the chest were first noticed.

A week before admission he began to have difficulty and pain in swallowing, and could only take milk and soup, and occasionally a fragment of meat. A Chinese physician was summoned from New York, who applied the moxa to both sides of the neck, the shoulders, and the elbows, but his condition continued to grow worse. Three days ago a watery discharge from the left ear began. He has had no trouble in emptying his bladder, though he has passed less urine than usually. He has had some cough with expectoration since he was first taken sick.

When first examined by us he was found suffering from extreme dyspnoea, and complaining greatly of a burning sensation about the chest: but whether this was felt internally or on the surface of the skin could not be discovered. He sat erect or leaning forward in bed, entirely unable to lie down, and able to sleep but little. The eyes were suffused, the temporal veins congested, the tissues of the face cyanosed and very oedematous, the tongue clean. The neck was symmetrically and very greatly swollen, pitting and tender on pressure. No enlarged glands could be detected in it. The tissues of the chest were everywhere oedematous, giving the impression that the patient was a stout man. The surface of the thorax was covered with numerous small varicose veins. The arms, forearms, and hands were oedematous, and somewhat cyanosed. The pulse was small, well filled, and the tension possibly slightly increased.

The oedema ceased entirely below the thorax, without any sharp line of demarcation, and the hips and legs were those of a slightly built man. The feet were cold.

The astounding contrast between the size and appearance of the upper and lower part of the body would have been ludicrous had not the extreme distress of the patient removed any feeling but that of pity.

The supra-condyloid and inguinal glands were distinctly enlarged.

The examination of the lungs was unsatisfactory on account of the extreme œdema of the subcutaneous tissues. The respiration was costo-abdominal and symmetrical. Anteriorly the right side seemed everywhere duller than the left, but there was no impairment behind. Vocal resonance was normal. Numerous fine mucous râles could be heard during inspiration over both bases posteriorly, though more on the right side, and with slightly prolonged and bronchial expiration. In front on the right side there were a few fine râles, heard chiefly on inspiration, and the respiratory murmur was feeble. Auscultation of the left lung showed nothing amiss. The determination of the cardiac dulness was also unsatisfactory on account of the œdema, but it appeared to extend from the third rib downward, and laterally from the right border of the sternum to the nipple-line. The apex-beat was in the normal position, and was rather forcible. A thrill could be felt over the apex and base. Auscultation at the aortic cartilage revealed a loud, musical murmur of a very peculiar character, reminding one of the sighing of the wind. Being loudest and highest-pitched with the cardiac systole, it died away very considerably during the diastole, and lowered its pitch by several tones, to rise again both in volume and pitch with the next systole. It was thus *continuous*, and had a distinctly venous quality, although unlike a venous hum in that it was distinctly rhythmic. The systolic portion of this murmur was transmitted very distinctly under the right clavicle, and, indeed, everywhere over the right chest, both in front and behind, and also into the vessels of the neck and down the arm as far as the elbow. It could be heard faintly and distinctly at the pulmonary and xiphoid cartilages, but not at the apex. The abdominal organs appeared to be normal.

Dr. C. M. Hay, at that time Resident Physician to the Hospital, made careful notes at short intervals during the time the patient was under observation, and abstracts from some of these show the course of the disease:

Sept. 25. The patient's condition is practically unchanged. Nitroglycerin has been given several times without effect, but he now appears to feel better after purgation with elaterium.

26th. Urine is acid, highly-colored, quantity small, albumin in moderate amount, specific gravity 1022. No casts, blood, epithelium, or pus.

28th. In spite of the elaterium and pilocarpine the œdema and cyanosis are more extreme. The patient sleeps very little, and breathes with considerable difficulty, and has attacks of coughing. The pulse is weak and irregular; that at the right wrist appears stronger than, though synchronous with, that at the left. The œdema, however, interferes with an accurate examination. The murmur is the same as at first. Respiration on the right side is fainter than on the left, and the percussion on this side seems everywhere duller.

30th. General condition the same. He complains of great burning in the throat and chest, especially on swallowing his whiskey.

Oct. 1. Expectored this morning about a tablespoonful of blood-

stained mucus. Swallows considerable food, but with pain and difficulty. The chief complaint still is of the burning pain in the chest, aggravated by swallowing whiskey. There is a faint systolic murmur heard at the apex, and probably transmitted to this spot. The venous murmur at the aortic cartilage and under the clavicle is plainer, and the loudest portion of it almost synchronous with the first sound of the heart.

3d. The œdema is greater. The left arm is more cyanosed and œdematous than the right, being $\frac{1}{2}$ inch greater in circumference at the elbow.

5th. Dropsy and cyanosis of the upper half of the body still greater, the swelling being more marked on the left side of the face and neck, and in the left arm, than on the right side. The left forearm measures 1 inch more than the right. No œdema of the lower part of the body. The patient still complains of intense burning pain after each dose of stimulant. He is subject to attacks of stupor of short duration, and at times is very irritable.

6th. The œdema is still greater in the left arm, but the right arm is much less swollen than it was a week ago. The œdema of the chest is slightly better. The right side of the chest anteriorly is still duller on percussion than the left. Posteriorly there is no material difference. No evidence of pleural effusion. Respiratory sounds normal on both sides. The venous murmur is of the same character as before, but is of a little lower pitch, and is loudest at the end of inspiration. The patient has for a week been taking iodide of potash, tincture of nux vomica, and tincture of digitalis; also codeia and pilocarpin p. r. n., and dry cups over the chest at intervals.

9th. There is to-day some œdema of the scrotum.

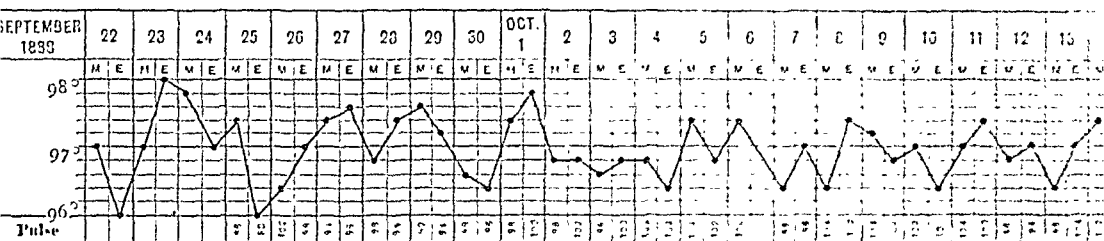
10th. Condition worse. Cyanosis very extreme. Swelling of the scrotum has disappeared.

12th. Dyspnoea more marked, and respiration labored and noisy, expiration being especially prolonged and stridulous. There is undoubtedly an area of percussion-dulness on the right side, extending downward to the upper border of the third rib, and transversely toward the left as far as the left edge of the sternum. The respiration on the right side is much louder and fuller than on the other, but in other respects there is nothing worthy of note. The heart sounds cannot be distinctly heard on account of the noisy respiration, and the venous murmur is not heard either at the aortic cartilage or under the right clavicle. Examination of the throat made by Dr. Reeves shows the half-arches of the palate covered with a muco-purulent secretion, and the larynx filled with the same. There seems to be a partial paralysis of the right abductor muscles, but the difficulty attending the examination renders the observation uncertain. There are diffuse redness and extreme congestion of the whole of the interior of the larynx, with a diffuse œdema of the larynx and trachea. The patient being in great agony, dry cups were to-day applied with marked relief. The presence of occasional stupor and of irritability is still noticed, and in a few instances he has seemed to be wandering in his mind, though it was not possible to determine this with certainty.

13th. The expectoration is distinctly more frothy and serous, and less purulent than during the preceding week, and contains to-day slight traces of blood. The patient breathes with much difficulty.

14th. The œdema has increased greatly in the entire upper half of the body. Respiration is stridulous and very labored, but has been relieved slightly by dry cupping. Numerous large and small mucous râles are audible throughout the chest, especially on the right side.

15th. At about noon, yesterday, blood oozed from the conjunctiva, and the sputum was tinged with blood. At 5.30 p. m. he had an attack of choking, and expectorated with great difficulty about 1½j of bright, arterial blood. At 6 p. m. he became very drowsy, and gradually grew more stuporous and unconscious. The pulse began to fail, the cyanosis became almost black. Cheyne-Stokes respiration developed and continued until death at 8.45 p. m.

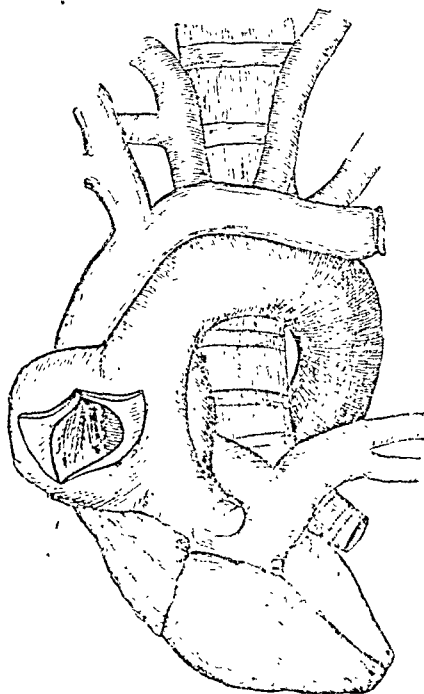


The temperature throughout the disease tended to be subnormal, as shown in the accompanying chart. Only once did it reach an elevation of 98° Fah.

Autopsy three hours after death: Man below medium height. No rigidity or ecchymoses. Cyanosis much less marked than during life. Upper half of the body œdematous. No œdema below the waist. Lower extremities emaciated and shrivelled. On incision through the skin there is profuse venous oozing. On opening the thorax the tissues of the anterior mediastinum appear matted together, and everywhere œdematous. Pericardium contains about an ounce of bloody serum. Heart as a whole not hypertrophied. Valves normal. Right auricle large, and its walls look thicker than normal. The index-finger enters the superior cava from the auricle for slightly over an inch, but then is tightly compressed. The inferior cava admits two fingers to the first joint. The coronary arteries are pervious and not calcified. The aorta is a little dilated, and 1½ inches from the aortic valves is an orifice the size of a half-dollar on the postero-lateral aspect of the convexity of the arch. This opening looks into an aneurismal sac projecting to the right and posteriorly, and of the size of an orange (see figure). The tissues around the sac are thickened. It is bounded on the right by the right lung, which it compresses, and to which it is adherent. Posteriorly it lies against the trachea and œsophagus and the right bronchus. The sac has everywhere thin walls, and is full of dark, moderately firm, non-laminated coagula.

The subclavian and innominate veins are pervious. At the junction of the right internal jugular and right subclavian veins is a globular thrombus the size of a large pea, lying behind one of the valves. The upper part of the superior cava is much thickened, and is compressed by the aneurismal sac, which lies directly upon it. At its termination in the venæ innominate it does not admit the tip of the little finger passed into it from above, and this narrowing continues throughout the course of the vein to a distance a little over 1 inch above the auricle. A

probe passed through the vein from above enters sometimes into the auricle, sometimes directly into the aneurismal sac. The œsophagus is tightly compressed by the aneurism, and the trachea is flattened in a lateral direction from the right side. The aneurism laid open shows within it and passing through it the thickened and compressed superior vena cava, and in the wall of the latter an irregular erosion $\frac{3}{4}$ inch in length in a vertical direction, beginning about 2 inches above the aneurism, and involving one-half of the circumference of the vein. The edges of this opening are irregular but smooth, and unoccupied by coagula.



A probe passed from the right auricle enters the aneurismal sac through the same opening. Just above the bifurcation of the trachea, at the point where this tube is flattened, there is an erosion of the cartilage, and possibly a small though not discoverable communication with the aneurism, since much blood is present in the trachea and bronchi. The recurrent laryngeal nerves are uninvolved. The lungs show extensive fibroid adhesions to the costal pleuræ on both sides, especially at the bases. There is no pleural effusion. The bases of the lungs are collapsed. At the apex of the right lung there is a cavity the size of a marble. The kidneys are distinctly fibroid, and the capsule slightly adherent and thickened. The brain reveals nothing of importance. The azygos vein does not appear to be dilated. The opening of the vein into the vena cava lies above the commencement of the constriction, and cannot be discovered.

An extended search through medical literature has brought to light only 28 cases of this lesion, including one (Case XVIII.) in which the

symptoms were quite typical, but in which recovery took place. With our own case the total number, therefore, equals 29. Brief abstracts of the salient features in the clinical histories of these cases are as follows:

CASE I.—Reported by Beevor. *Lancet*, 1832-33, i. 800, and ii. 62.

Previous history: Not given.

Symptoms following the rupture: Enormous turgidity and varicose condition of the veins over the chest, which inosculated freely with the epigastric veins, etc. Œdema of the head and upper extremities [and chest?]. Auscultation revealed the presence of an aneurism. Man very rapidly sank, and latterly had terrified notions about his situation, thinking he was among thieves, men of blood, murderers, etc.

Duration of symptoms following rupture: Not stated.

Autopsy: An aneurism of aorta, capable of holding a pint of fluid; had produced interstitial absorption of sternum. Vena cava quite impervious for $\frac{1}{2}$ inch, beginning 1 inch above right auricle; and just above the obliteration was a rent in the coats, which led directly into the enlarged aorta beneath. The azygos greatly dilated; entered cava just above the point of obstruction. At entrance of left subclavian [innominate?] was another and larger rent leading also into the aorta, and constituting a second communication between arterial and venous systems. Heart normal.

This case is quoted by Peacock (*Trans. Path. Soc. Lond.*, xix. 127) as identical with the following. They are, however, distinct, as the first, with autopsy, was reported March 5, 1833, while the second patient did not die until August 4, 1833.

CASE II.—Reported by Thurman. *Med.-Chir. Trans.*, 1840, xxiii. 323. See also *Lancet*, 1832-33, ii. 666.

Previous history: Coachman, aged forty-one; intemperate; much exposed to wet and cold. For a long time cough, dyspnoea, and palpitation.

Symptoms following the rupture: For a few days pain in neck and shoulders, replaced by swelling and purple color of face, then, in a few days, of chest, especially on right side, and of right arm. Clusters of veins, almost varicose, over chest and back. Pulse 100, rather hard. Sense of weight and stiffness over shoulders. Dizziness, stupor, confusion of mind. Dulness on percussion, distinct impulse, and vibratory murmur under right clavicle and to right of upper part of sternum. Same murmur, not so loud, over right carotid and origin of aorta. Some crepitation over both sides chest behind, especially above. Œdema became extreme; spread to left arm, and slightly to ankles and scrotum some days before death. Cough worse; dyspnoea finally extreme; expectoration difficult and tinged with blood. Toward end delirium almost constant.

Duration of symptoms following rupture: About 2 months.

Autopsy: Heart large; ventricles dilated; valves normal. A diffuse, true aneurism of ascending aorta, size of fist, commencing with pericardium and extending for $1\frac{1}{2}$ inches above the valves, principally on right side. Vena cava behind aneurism; a round perforation $\frac{1}{2}$ inch across and with smooth edges, $\frac{1}{2}$ inch above entrance of azygos vein, opened into sac. Lungs crepitant. Pleural adhesions both sides.

CASE III.—Reported by Reid. *Edinb. Med. and Surg. Journ.*, 1840, liii. 95. Specimen also studied by Thurman. *Med.-Chir. Trans.*, 1840, xxiii.

Previous history: Tinsmith, aged thirty-five; intemperate; long been subject to palpitation.

Symptoms following the rupture: After lifting heavy weight had uneasy sensation in chest as though something giving way. Soon œdema and lividity of upper part of body, and confusion of mind. When examined after three

weeks showed great œdema and lividity of arms and chest, and especially of face and neck. Conjunctivæ injected. Much dyspnœa; some cough and difficulty of deglutition. Urine scanty. Heart's impulse strong; apex depressed. Double bellows-murmur over cardiac and sternal regions, especially upper part of latter; the systolic portion more prolonged, the diastolic shorter and sharper. Extended dulness over heart and upper part of sternum. Later œdema increased, with slight swelling of scrotum. Orthopnœa; delirium; died suddenly.

Duration of symptoms following rupture: 4 weeks.

Autopsy: Aorta at origin suddenly dilated, forming aneurism size of fist, limited to sinuses of Valsalva. Projected into anterior and left part of right auricle, and here it had termination of superior vena cava stretched over its outer surface. This portion of the auricle and the termination of cava communicated with sac by two oval openings with defined, rounded edges. Would barely receive tip of little finger. Cava pervious, but must have been compressed by the aneurism. Heart hypertrophied; left ventricle dilated; valves healthy; pericardium universally adherent. About a quart of serum in each pleural cavity. Lungs compressed, small; contained considerable blood and frothy serum.

Though this is really an instance of perforation into the right auricle, the superior cava was involved as well, and the case may, therefore, with propriety be included here, particularly as the symptoms were purely those of rupture into the cava.

CASE IV.—Reported by Young. *Edinb. Med. and Surg. Journ.*, 1841, lv. 63.

Previous history: Gentleman, aged fifty-six; temperate; well until attack of rheumatism. In a year another attack, and at same time loud, ringing cough lasting some weeks.

Symptoms following the rupture: Some months later, without premonitory symptoms, suddenly taken at night with deep blackish-purple color and great swelling of face, neck, and chest as far as second rib. Veins of forehead and temples very prominent. Headache. No dyspnœa. Next day respiration rather difficult; great restlessness; headache persisted. Pulse small and compressible. Over middle of sternum an impulse stronger than that over heart. No thrill or murmur anywhere. Chest had become œdematous, which hindered percussion being employed. Dyspnœa became excessive, and great dysphagia developed; both apparently due to swelling in neck. Respiration bronchial in back, with râles. No further examination of heart, probably on account of excessive restlessness. Patient talked incoherently. Death.

Duration of symptoms following rupture: About 2½ days.

Autopsy: Livid color almost entirely gone, and œdema much less. Pericardium adherent to sternum. Heart not hypertrophied; valves normal except aortic, which was thickened, and orifice dilated. Aneurism of ascending portion and of arch, holding 1½ pounds. Vena cava stretched over sac and adherent to it; a perforation in vein over ½ inch in length, with retracted, thin, and irregular edges, and situated at about the level of the entrance of azygos vein; opening into right wall of aneurismal sac.

CASE V.—Reported by Law. *Dublin Med. Journ.*, 1842, xxi. 433.

Previous history: Man, aged forty-two; always well up to onset of the symptoms.

Symptoms following the rupture: Took a morning walk, and, not feeling well, lay down; face suddenly became swollen and dark purple. When seen next day, face, upper part body, hands and arms deeply livid; face, neck, upper part chest very much swollen. Suffusion and serous infiltration of eyes. Veins of neck hard and cord-like. Heart-sounds heard beyond ordinary limits, especially toward right subclavicular region; in other respects heart normal. Examination of lungs negative. Repeated examinations of heart

and lungs gave no other results. No pain; but distress, discomfort, oppression. Very feeble pulse at wrists; strong in femorals. Subjective symptoms increased. Intellect became torpid, but no coma, and patient died suffering.

Duration of symptoms following rupture: 6 days.

Autopsy: Aneurism size of small orange from posterior and right side of ascending aorta. Beginning 1 inch above its entrance into heart, the walls of the vena cava were thickened for about 1 inch, and closely approximated by the pressure of aneurism. At this point was an unobstructed circular perforation about 2 lines in diameter opening into sac. Partial adhesion between opposite sides of vein. Aortic valves normal.

CASE VI.—Reported by Cossy. *Archives Gén. de Méd.*, 1845, ser. 4. t. ix. 33.

Previous history: Woman, aged forty-five; began fourteen years before to have slight attacks of palpitation and oppression. These gradually increased in intensity and duration. Finally palpitations became painful, but did not interfere with her work.

Symptoms following the rupture: Without further premonitory symptoms woke one morning with dizziness and some swelling, and violet color of face and right arm. Two hours later extreme dizziness, and consciousness lost for several minutes. By evening face and arms greatly swollen, the right more than the left. Swelling increased. Examination ten days later showed face, arms, and neck much swollen and intensely violet; right arm larger than left. Chest not affected. Giddiness; sense of painful tension in head; continual noise in right temple and ear. Numerous veins outlined on face; none seen on arms. A distinct shaking of chest with heart's impulse, but without heaving or thrill. Heart seemed enlarged. A very loud, long, widely diffused, rasping, systolic murmur heard with maximum intensity under sternal end of right clavicle. Here complete dulness on percussion, but no pulsation or thrill. Posteriorly murmur loudest in right infra-spinous fossa. Above internal half right clavicle a pronounced systolic pulsation and thrill extending into vessels (veins) of neck of this side only. Radial pulse feeble, narrow, synchronous on two sides. Dry cough; slight dyspnoea; no râles. Dulness and feeble breathing behind on right side below. Later veins of forehead and the jugulars became a little more prominent. Sleepiness and then coma developed.

Duration of symptoms following rupture: 11 days.

Autopsy: Brain very pale. Hydropericardium. Hydrothorax both sides. Heart hypertrophied; valves normal. An aneurism size of hen's egg situated on convex portion of ascending aorta below origin of innominate. Vena cava on its posterior wall and adherent to it. A perforation 9 mm. high and 5 mm. broad, situated 15 mm. below entrance of innominate vein, opened into aneurismal sac. Cava only 26 mm. wide here, but below, at entrance of azygos, was 55 mm. wide. Azygos not dilated.

CASE VII.—Reported by Mayne. *Dublin Quart. Journ. Med. Sci.*, November 1, 1853, 257.

Previous history: Woman, aged fifty; laborious work. Well until forty-fourth year. Then dyspnoea, cough, and palpitation on going up stairs began. Had had since then several attacks of severe oppression, relieved by venesection. Symptoms grew worse, prevented regular work. Stooping especially bad, as it produced dyspnoea and swelling of eyelids, face, and hands.

Symptoms following the rupture: While stooping suddenly felt as if strangled; persistent, intense feeling of suffocation; giddiness; remarkable change in color of face; breathing greatly embarrassed; absolute orthopnoea. Examination next day showed deep plum color and great oedema of face, neck, shoulders, and upper part thorax. Veins enormously distended, and in many places varicose. Eyes seemed starting from head, and showed extensive sub-conjunctival oedema. Occasional short cough without expectoration. Pulse jerking, like aortic regurgitation. Dulness on percussion

bounded by left edge of sternum and line from sternal third of right clavicle to within 1 inch of nipple. A very strong heaving systolic impulse in second and third right intercostal spaces; vastly greater than at apex. Over impulse a very distinct thrill, and a remarkably loud, single, systolic, widely-diffused superficial bruit; maximum at second right costal cartilage; so loud that heart's action could not be accurately explored. Respiratory murmur inaudible over upper part right chest in front. No râles anywhere. Purring tremor felt in right subclavian and internal jugular veins. None in left. Temporary improvement followed venesection; then obstinate vomiting, stupor, drowsiness, delirium, convulsions, death.

Duration of symptoms following rupture: 8 days.

Autopsy: Congestion and œdema of parts supplied by superior cava. Right internal jugular nearly as large as small intestine. Serum in brain cavities. Lungs healthy; their mucous membrane very vascular. Heart healthy. Aneurism of aorta in shape of enormous dilatation occupying entire arch and about 2 inches of descending portion. Right and left innominate veins and superior cava adherent to surface of sac. Left innominate and cava considerably constricted where adherent; but below, from point of entrance of azygos, cava of normal size. Opening size and shape of shirt button-hole on right side of sac into vena cava; its edges sharp and irregular, as if recently made.

CASE VIII.—Reported by Goupil. *Thèse de Paris*, 1855, No. 50, vol. vi.

Previous history: Cavalry officer, aged fifty-eight; always some shortness of breath, which had increased during last twelve years. Odema of lower extremities at times for several years.

Symptoms following the rupture: After fit of anger lost consciousness. This followed by violent palpitation and excessive dyspnoea, with rapidly-increasing œdema, cyanosis, and dilatation of veins of upper part of body. At base and at right side sternum a soft, prolonged, systolic murmur, and a stronger and harsher diastolic murmur. Suffocative attacks, restlessness, headache, and attacks of fainting developed. Pulse rapid, small; heart's action violent; death.

Duration of symptoms following rupture: 1 month.

Autopsy: Left ventricle hypertrophied. No disease of valves. Aorta atheromatous; became dilated immediately above the valves. An aneurism, size of hen's egg, began 5 cm. above the valves, and, projecting backward and to right, pressed on right auricle, superior cava, right bronchus, and pulmonary artery. Vena cava compressed; and just below entrance of azygos vein an oval perforation into aneurism, 35 mm. in circumference, with irregular, red, eroded edges. The portion of vena cava below the entrance of azygos flattened and much smaller than above. Azygos vein dilated. Double hydrothorax. Lungs compressed.

CASE IX.—Reported by Tripier. *Thèse de Paris*, 1863, p. 63. Quoted by Peacock. *Trans. Path. Soc.*, London, 1868, xix. 140.

Previous history: Travelling merchant, aged fifty-five; temperate; always well except occasional dizziness.

Symptoms following the rupture: Taken suddenly at night with vertigo and dyspnoea, followed by very marked swelling and lividity of head, neck, face, arms, and upper part trunk, with distention of veins. Nothing remarkable about respiration. Sounds of heart normal; but 3 cm. from right side sternum beneath clavicle was dulness, pulsation; soft, feeble systolic murmur. Pulse small and frequent. Great agitation, followed by delirium and lapsing into coma, with increased evidences of obstruction of venous circulation. Death.

Duration of symptoms following rupture: 15 days.

Autopsy: Aneurism, large as fist, egg-shaped, projected to right and posteriorly from aorta above the valves. Adherent to pulmonary artery and to vena cava. Vena cava, though flattened and contracted where in contact with aneurism, was permeable throughout, and again expanded below. A

perforation into aneurism of button-hole shape, 2 cm. long, situated 2½ cm. from commencement of vein. Its edges slightly broken, and very fine and close together. Fluid in pericardium. Slight hypertrophy of heart. No disease of valves. Great congestion of membranes and substance of brain.

CASE X.—Reported by Eastes. *Med. Times and Gaz.*, 1864, i. 393. See also report by Gull. *Lancet*, 1864, i. 409.

Previous history: Arsenal laborer, aged thirty-four; cough and dyspnœa more or less since Crimean war, and carrying load always caused cough and soreness across chest.

Symptoms following the rupture: About five weeks before seen, face, neck, and right arm began to swell and grow purple; left arm slightly so. Dyspnœa much worse, especially on exertion. Examination showed great cyanosis and œdema of upper half of body; veins of thorax engorged; cough severe, with frothy sputum. Decided dyspnœa; no dysphagia. Pulse small, regular, weaker on right side. Diastolic thrill over right side chest. A soft, whizzing, and very distinct murmur of venous character over aorta; diastolic at commencement of arch, but both diastolic and systolic, but chiefly the former, passing upward and over middle of arch. Maximum intensity at third right costal cartilage. The murmur had a continuous churning sound, like that in enlarged vessels in thyroid gland. No sound in right side neck. Percussion normal. Coarse crepitation at bases, both lungs posteriorly; bronchial breathing at right side in front. Dyspnœa, cough, and œdema increased. Erysipelatous inflammation set in. Death.

Duration of symptoms following rupture: About 7 weeks.

Autopsy: Aneurism, size of fist, on right and posterior wall of ascending aorta; its mouth extending from 1 inch above valves to innominate. Superior cava lay in front of sac. At its back part, just above auricle, was a perforation into sac, size of lead-pencil and with smooth edges everted toward the vein and evidently not recent. Aorta atheromatous. Heart of natural size. Lungs crepitant; much mucus in the tubes. Fresh pleuritic adhesions between right lung and pericardium. Recent pericarditis with effusion.

CASE XI.—Reported by Gallard. *L'Union Méd.*, 1865, xxvii. 564.

Previous history: Basket-maker, aged sixty; always well except for attacks of oppression with cough at times, terminated by abundant expectoration.

Symptoms following the rupture: Suddenly in middle of night extreme difficulty in breathing and a violet coloration of face. When seen next day very marked cyanosis of face, neck, arms, and upper part of trunk, with some coldness and œdema. Cyanosis became intense. Injection and some chemosis of eyes. Subcutaneous veins swollen without pulsation. Œdema of entire upper half of body developed, alike on both sides. Dulness extending under sternum to under right clavicle, and a vibratory thrill over dulness. A widely-diffused systolic and diastolic murmur; its maximum intensity under right clavicle at the position of the dulness, where it was strong and rasping. Weak at apex; heard under clavicles and in carotids; heard down back. Its maximum intensity in back was at right of fourth dorsal vertebra. Pulse same force in two radials. Voice a little rough; respiration frequent, labored, a little noisy. No dysphagia. Next day unconscious; stertorous; very great œdema; general coldness; insensibility of skin and mucous membranes; feeble, rapid pulse; death.

Duration of symptoms following rupture: About 2 days.

Autopsy: Ascending and transverse portion of arch very much dilated. The ascending portion had sacculated aneurism. Vena cava compressed and adherent between aneurism and arch of aorta; so narrow that a uterine sound could hardly pass. Perforation into sac, size of a silver 29-centime piece, situated just below entrance of azygos vein. A clot contained in aneurism obstructed it and projected through it. Trunk of azygos slightly flattened, compressed by calcareous gland. Innominate and azygos veins voluminous and engorged. Aorta atheromatous. Nothing to note in heart.

CASE XII.—Reported by Hayden. *Dublin Quart. Journ. Med. Sci.*, 1866, xli. 434.

Previous history: Mason, aged thirty-three; intemperate; always well; strained himself in lifting heavy stone, and felt acute pain in dorsal region and could not work for some days. Two weeks later felt sudden faintness and a weakness in limbs; passed off in few minutes. About this time seen at hospital, and slight hoarseness and cough noticed.

Symptoms following the rupture: In three weeks more seen again, and presented the symptoms of the lesion. Deep cyanosis and œdema of entire upper part of body down to diaphragm. Conjunctivæ injected with dark venous blood. Especially face and neck deep purple. No thrill in veins of neck. Chest covered with tortuous veins in groups. Temperature of upper half body low, and man complained of chilliness in that part. Pulse small, regular, rapid. Cough and expectoration. Respiration 24. No dysphagia. Percussion less resonant to right of sternum from clavicle to nipple, and respiration feeble here and down to infra-spinous fossa behind. Elsewhere loud, with muco-crepitant râles. Precordial dulness increased; impulse strong; no thrill; apex behind ensiform cartilage. Over base double murmur; the systolic coarse, loud, maximum intensity at junction of third right costal cartilage, with sternum, heard in carotids, diffused over chest, especially on right side, also heard in right infra-spinous fossa. The diastolic murmur confined to region of base, heard over lower portion of sternum; replaces second sound. A feeble impulse and thrill felt at seat of maximum intensity of systolic murmur to right of sternum. Engorgement grew worse; some difficulty in swallowing; slight delirium, then drowsiness. Death quiet.

Duration of symptoms following rupture: Over 10 days; not over 3 weeks; exact time uncertain.

Autopsy: Lungs hyperæmic, œdematous. Pericardium entirely adherent to heart. Heart and valves showed nothing of importance. Aneurism as large as apple of moderate size, with opening into it from aorta about $\frac{1}{2}$ inch above valves. Compressed right branch of pulmonary artery, right bronchus, and vena cava. Vena cava pressed forward and outward by it; occluded from entrance into auricle up to $\frac{1}{2}$ inch below entrance of azygos vein. The opposite sides of intima of cava at its opening into auricle were partially adherent, probably congenitally, leaving one passage on each side; the one admitting a probe, the other the little finger. Three perforations existed from the sac into the cava; one the size of a three-penny piece, the others much smaller. Their edges were thin, jagged, and bordered by red areolæ on the lining membrane of the vein.

CASE XIII.—Reported by Jacoby. *Berlin. klin. Wochenschr.*, March 28, 1870, 158.

Previous history: Railway employee, draughtsman, always been well except hemidrosis of upper half body; did not know whether of lower half of body as well. First symptom a hindrance of motion in neck and some swelling there. Next day same.

Symptoms following the rupture: On this second day, as he leaned over his drawing, had sudden sense of being unwell; blueness and swelling of face and neck developing in course of two days. On third day intense blueness with œdema, and coldness of upper half body; sharp, zigzag color-line of demarcation at lower part of thorax; scleræ dark bluish-red; jugular veins prominent, very full. Sweat over whole upper part body. Radial pulses isochronous, small, compressible; left pulse much weaker than right. No dyspnoea at first, but sense of oppression. No pain. Percussion and auscultation of lungs normal. Heart's impulse feeble. No pulsation or thrill in upper part chest. Loud buzzing murmur of greatest intensity at position for listening to aortic valves; loudest with systole, but continuous; and lasting, though not so loud, through diastole; widely diffused over chest. Not heard behind to left of vertebral column over the aorta. Not heard in femorals; faint in carotids. Besides murmur, two normal sounds could be

heard at apex. Œdema increased; very little urine voided; dyspnœa developed, then orthopnœa. Some roughness of voice. Very somnolent. Death with symptoms of slow carbonic dioxide poisoning.

Duration of symptoms following rupture: 7 days.

Autopsy: Cyanosis largely disappeared; cutaneous ecchymoses both sides thorax; œdema persistent. Double hydrothorax. Nothing characteristic in lungs. Heart small; valves normal. Large saccular aneurism of ascending aorta, 9 cm. broad in widest part. Lining of sac atheromatous, uneven, and with numerous small aneurismal dilatations in the wall, of size of pea to that of walnut. Aneurism evidently an old one. Vena cava, at about its entrance into auricle, narrowed to size of crow's quill, and closely adherent to one of the little aneurisms of the size of cherry; and a slit-like perforation 4 lines long with smooth edges opened into this. A colorless old clot projected through it from the sac, and thus still more narrowed lumen of cava. Shortly above this very narrow part cava resumed normal size. Bronchi, œsophagus, and trachea not compressed.

CASE XIV.—Reported by Farrington. *Philad. Med. Times*, January 3, 1874, 216.

Previous history: Woman, domestic, aged sixty-one; moderate indulgence in alcohol; no venereal history; rheumatism seventeen years before, otherwise always well. About a year previously small tumor appeared right side of chest near sternum. No cause known unless it was repeated straining in lifting clothes-baskets. In about two months sharp pain down arm to elbow; sometimes in chest in region of tumor. These pains persisted. Voice hoarse for eighteen months. No cough; no dyspnœa.

Symptoms following the rupture: After great excitement there developed intense cyanosis and great dyspnœa. Extremities cold; pulse small, rapid, short, sharp; no difference between the two sides. Pulsating tumor with dulness and thrill, extending 3 inches to right of sternum from second to fourth rib. Also double murmur, with greatest intensity over this region, transmitted into vessels of neck; diastolic portion loudest. Systolic murmur at apex also. Lungs normal. Symptoms persisted with great restlessness and an attack of vomiting.

Duration of symptoms following rupture: About 15 hours.

Autopsy: Aneurism, size of apple, from junction of ascending and transverse portions of arch, projecting forward and to the right. Vena cava compressed by aneurism, and in the wall of the vein, at junction of innominate veins, was a transverse slit, $\frac{1}{2}$ inch in length, communicating with aneurism. Aorta showed chronic endarteritis. An aneurismal sac in descending aorta, pressing on upper lobe left lung. Heart not hypertrophied. Aortic valves thickened and slightly insufficient.

CASE XV.—Reported by Bonnarel. *Thèse de Paris*, 1875.

Previous history: Coachman, aged fifty-six; intemperate; always well until eighteen months previously, when an attack of dyspnœa necessitated rest from work for a time. Since this occasion respiration been somewhat oppressed.

Symptoms following the rupture: Without known cause dyspnœa greatly increased and cyanosis appeared. When seen after eight days exhibited orthopnœa; face, neck, upper extremities, and upper part trunk cyanosed, more on right than left side; small vessels distended, especially on nose and cheeks. Face and upper extremities [and thorax?] œdematous. No œdema of lower part trunk or lower limbs. No pain. Voice harsh. No venous pulsation in swollen jugular veins. Left radial pulse weaker than right. Apex-beat lower than normal; no thrill. A strong, not harsh, systolic, blowing sound heard with maximum intensity at inner part first right intercostal space. Heard also over base; also posteriorly along spine. Respiration scarcely audible on right side. On left side sibilant râles. Dyspnœa and cyanosis increased; death.

Duration of symptoms following rupture: 16 days.

Autopsy: Entire arch aorta, particularly ascending and transverse parts, enormously dilated; 35 cm. its greatest diameter. Displaced vena cava and right phrenic nerve and the lungs somewhat, especially the left. Flattened right bronchus slightly. The dilated aorta presented several secondary aneurismal dilations, one of them size of egg. Vena cava remarkably elongated; its walls intimately adherent to those of aorta. A slit-like perforation, 1 cm. long, opened into aorta about 13 cm. above the aortic valves. About 5 mm. above this was another perforation, round, 6 mm. in diameter, with ragged edges. Heart hypertrophied; valves normal. Some fluid in pleural cavities.

CASE XVI.—Reported by Schnaubert. *Ejened. klin. Gaz.*, St. Petersburg, 1881, i. 81, 105.

Previous history: Butler; aged forty-two; moderate drinker; never syphilis; fifteen years ago kicked in chest by horse, but soon recovered; three years ago asthma and palpitation, which soon disappeared.

Symptoms following the rupture: After great exertion at nocturnal conflagration had chill; then sense of heat in head, dysphagia, swelling of face and neck. Examination two days later showed head, neck, arms, and chest down to third rib bluish-red and considerably swollen. Veins distended, but not pulsating. Mucous membrane of mouth and throat purple and conjunctivæ injected. Some difficulty in swallowing. Vomited several times. Dulness on percussion, extending from middle of sternum to 3 cm. to right of its right edge and down to fourth rib. No pulsation in any part of chest. Loud, rasping, double murmur over area of dulness and over sternum; less distinct posteriorly over centre of left scapula. Radial pulses equal. Respiration rather stertorous; 24 in the minute. Some somnolence. Noises in the ears. Temperature in the axilla 36° C. Later, cyanosis and œdema reached to lower ribs. Murmur was sometimes absent, sometimes only systolic or diastolic, sometimes double. Dulness extended somewhat. Hydrothorax developed. Œdema reached to hips and penis. A slight pulsation at times felt in region of subclavicular dulness. Dyspnoea; hallucinations; increasing cyanosis; delirium; death.

Duration of symptoms following rupture: 5 weeks.

Autopsy: Aneurism, size of hen's egg, starting about 5 cm. above aortic valves and extending toward right. Compressed right branch of pulmonary artery and the vena cava. Was adherent to right lung. Vena cava greatly distended; but about 5 cm. above the heart much narrower, compressed by aneurism, and filled with thrombus. In centre of compressed portion was a circular perforation, $\frac{1}{2}$ cm. in diameter, opening into sac. Compact, adherent thrombus in right jugular. Right auricle and ventricle distended. Lungs œdematous. Bloody mucus in bronchial tubes. Hemorrhagic erosions in stomach.

CASE XVII.—Reported by Halla. *Zeitschr. f. Heilkunde*, 1882, iii. 122.

Previous history: Smith; aged sixty; always healthy; severe work.

Symptoms following the rupture: Suddenly, while lifting iron, developed cyanosis and œdema of upper half of body. Left arm swollen before the right. Jugular veins dilated; dense network of dilated veins on thorax; some dyspnoea; drowsiness; more or less dysphagia. When seen after sixteen days exhibited extreme cyanosis and œdema of upper half of body, with irregular line of demarcation in region of navel. Dense network of veins on chest. Eyes prominent. Some slight œdema of genitals and upper part thighs, and some dyspnoea and dysphagia. No tumor visible on chest. A diffuse, weak, systolic trembling without thrill felt from under right clavicle to right nipple; stronger than apex-beat. Very marked thrill on left side of neck, especially above left clavicle; weaker thrill on right side neck. A percussion-dulness extending about 3 fingers' breadth from middle line toward sternal end right clavicle, and joining the cardiac dulness extending nearly to right nipple-line. A very loud, sharp, blowing, systolic murmur heard with greatest intensity over aortic cartilage, widely diffused, prolonged into diastole. Two

normal sounds at apex. Aortic and pulmonary second-sounds present. A very loud systolic murmur heard above and below left clavicle; weaker murmur in carotids and under right clavicle, and in last position was loudest during expiration. Left pulse slightly smaller than right; both show influence of respiration. Respiration anteriorly vesicular, weak on left side; posteriorly rough and broncho-vesicular except right upper part, where was vesicular. Tongue swollen; voice hoarse; paralysis of right posterior crico-arytenoid, with œdema of larynx. Later, double hydrothorax; catarrhal and œdematous swelling of bronchial mucous membrane; increasing œdema, dilatation of veins, dyspnoea, dysphagia, and cyanosis; expectoration tinged with blood; chemosis of conjunctiva of right eye; increasing laryngeal œdema and stridor; oozing of serum from skin. Temperature had been subnormal; urine scanty, no albumin. Death after short sopor.

Duration of symptoms following rupture: 30 days.

Autopsy: Aneurism of aorta, larger than fist, beginning 3 cm. above valves and reaching to innominate artery, projecting to right; interior atheromatous. Contained several small dilatations. Vena cava behind and to right of aneurism; its whole length, except lower 2 cm., as well as about 3 cm. of left innominate vein adherent to sac. Cava compressed, the greatest narrowing being just below entrance of azygos vein. 1 cm. above azygos was a slit-like perforation, 7 mm. long, with smooth, rounded edges, opening into aorta. At this point cava began to widen again.

CASE XVIII.—Reported by Damaschino and Lavin. *La France Médicale*, 1882, i. 805, 819.

Previous history: House-painter; aged fifty; always healthy. Twenty-two years before had strained himself lifting; felt sense of oppression in chest for some hours, but always well since.

Symptoms following the rupture: Suddenly, after stooping and lifting weight of 150 pounds, his friends noticed that his face was blue. No pain, oppression, or palpitation. Cyanosis spread to whole of head in a few hours. By next morning, face, neck, and right arm swollen. By afternoon, left arm also, and he felt constriction in throat, and general feebleness. By evening, all upper part body exhibited venules. In five days a little roughness of voice, and veins of face, arms, trunk, including subcutaneous abdominal veins, commenced to develop. When seen six days after onset there was cyanosis of skin and mucous membrane, œdema of upper portion of body, distention of veins, and development of network of venules. Both arms very œdematous, especially right. Upper part thorax slightly prominent, especially right side. Apex-beat feeble in sixth interspace close to sternum. Cardiac dullness seemed enlarged, but œdema prevented accurate determination. On right side a dullness from middle of clavicle to fourth interspace, extending about 3 fingers' breadth to right beyond sternum. A thrill at upper part right side, reaching above clavicle. A centre of pulsation in third interspace at right edge of sternum and a second centre at apex, not so well marked. In second interspace to right of sternum a rough, systolic murmur and a blowing, diastolic murmur, the two being almost, but not quite, continuous. $3\frac{1}{2}$ cm. below middle of right clavicle was a very intense and actually continuous murmur, with systolic reinforcement. It was remarkable, especially during the reinforcement, for the peculiar sonorous and vibratory character. It was transmitted with the same characters to the base of the neck and even to the lower part of the thorax posteriorly on the right side. It disappeared at the right border of the vertebral column, and here could be heard in contrast the double aortic murmur first described, with the same characters as heard at the centre for this murmur at the base. Pulse regular. A double murmur heard in femorals. Axillary temperature normal, though the patient complained of feeling cold. Lungs normal. Cough and some bloody expectoration. No palpitation or pain. Some vertigo and oppression on walking. Patient improved, and after being under observation nearly one month the œdema disappeared entirely from the face, arms, and neck, and almost from the trunk, and there was but very faint

cyanosis when at rest, though it returned on quick motion. All the veins of trunk, upper extremities, and roots of thighs very greatly developed.

Duration of symptoms following rupture: Patient left hospital practically well, in the condition described, with collateral circulation well established.

CASE XIX.—Reported by Glasgow. *St. Louis Cour. of Med.*, 1884, xi. 407, and 1885, xiii. 1.

Previous history: Physician; aged fifty-seven; previous good health, except for several accidents. For some months, dyspnoea on unusual exertion.

Symptoms following the rupture: On lifting a man he felt sudden rush of blood to upper part of body. Face and hands swollen and purplish. No dyspnoea or pain. Soon entire upper part body swollen, cedematous, and cyanosed. General enlargement of superficial veins, with spots of ecchymoses. Eyes half closed; pulse soft, full, jerking like that of aortic regurgitations. Dulness over sternum for 3 inches in breadth, and from second to fourth ribs. Strong heaving impulse here, with exquisite thrill, especially at right edge of sternum. Double murmur heard at aortic cartilage and transmitted over sternum and præcordium; diastolic portion ended musically. Over rest of chest only single systolic murmur could be heard; this audible in larger arteries, even in brachial. Appreciable pulsation in liver, and distention of large superficial veins of abdomen. A second examination, after somewhat over a month, showed remarkable improvement in everything except an increased percussion-dulness and occasional great swelling of legs. Soon after this great dyspnoea on exercise began to develop, hydrothorax and general oedema appeared, dulness of aneurism increased greatly, but impulse could only be felt in third interspace to left of sternum. Systolic bruit faint; respiration feeble. Finally, there was increasing oedema, greatest on left side face, neck, and chest; marked cyanosis and dyspnoea. Death.

Duration of symptoms following rupture: 7 months.

Autopsy: Lungs engorged; large amount of fluid in pleural cavities. Heart enlarged; right auricle enormously dilated; left ventricle hypertrophied; valves healthy. Globular aneurism, 4½ inches in diameter, occupying first portion of arch, extending to innominate artery. Compressed left innominate vein and pulmonary artery. Walls of aneurism atheromatous. A perforation, size of goose-quill, into vena cava situated at upper right side of sac; closed by a thick plate of laminated fibrin. Superior cava greatly dilated; the opening into aneurism immediately below entrance of innominate veins. Azygos vein greatly enlarged. Inferior cava greatly distended.

CASE XX.—Reported by Wetterdal and Wallgren. *Upsala Läkareförenings. Förhandlingar*, 1884-5, xx. 325.

Previous history: Man; aged thirty-four; always done hardest work without difficulty. Probably had had syphilis, but not certain. Used alcohol to excess.

Symptoms following the rupture: Suddenly, while putting forth violent exertion, had a chill; felt a sense as of something sticking in throat; general sense of soreness in thorax; headache. In half-hour blueness in face and hands, and dizziness. On reception into clinic that afternoon patient complained of dyspnoea and severe headache and dizziness on sitting up. Face, arms, and upper part trunk very cyanotic, with a well-defined line of demarcation at lower part thorax. The larger veins much swollen. Great oedema of the cyanotic portions, with distention of the veins. Cardiac dulness not enlarged. No abnormal dulness in chest, and no heart-murmurs or abnormal pulsation. No pulsation in jugular veins. Above right sternoclavicular articulation and toward right external jugular vein was a booming sound with cardiac systole. Radial pulses isochronous. Dyspnoea, headache, and oedema rapidly increased. Ten hours after admission gave sudden cry and died.

Duration of symptoms following rupture: Less than 24 hours.

Autopsy: Sacculated, fist-sized aneurism of ascending aorta, closely adherent to superior cava. In vena cava 4 cm. above heart was a perforation

into aneurism 7-8 mm. in diameter; its edges sharp, a little swollen, and inverted toward vein. Lungs œdematous.

CASE XXI.—Reported by Turner. *Transactions Path. Soc. London*, 1885, xxxvi. 148.

Previous history: Man, aged forty. History of venereal disease; always hard work; no sudden strain or assignable cause.

Symptoms following the rupture: Disease began with dyspnœa. When seen after seven weeks there was dyspnœa; much swelling of upper parts; face dusky; superficial veins enlarged, especially over chest. Loud to and-fro bruit over aortic valve and apex; obscure pulsation over upper part sternum; evidence of pressure on right bronchus; some huskiness of voice and contraction of right pupil. Death from increasing pulmonary obstruction.

Duration of symptoms following rupture: 23 weeks.

Autopsy: The ascending aorta much elongated, with a large sacculated aneurism projecting toward the right. Probably was a dissecting-aneurism originating in a transverse rupture of the vessel. Mouth of aneurism on convexity of vessel extending from $\frac{3}{4}$ of an inch above free border of aortic curtains upward 2-3 inches. Sac had compressed, closed, and finally passed through the vena cava, completely separating its proximal and distal portions and projecting between them. Distal portion looked like a short arterial trunk given off from aneurism near its upper border. There was free passage of blood from sac into vein. Aorta quite atheromatous. Aortic valves calcareous; orifice stenosed. Mitral valves thickened. End of trachea and right bronchus compressed by aneurism. [Right?] lung congested, œdematous, and adherent to chest-wall. Much effusion in left pleural cavity. [Proximal portion of vena cava probably pervious, as it is not stated to the contrary.]

CASE XXII.—Reported by Shannon. Report of Surgeon-General of Army (U. S.), 1886, p. 101.

Previous history: Sergeant. No history of previous trouble, except that for few days had had slight dizziness on stooping.

Symptoms following the rupture: At once, after great excitement, felt a terrible rushing of blood to head. Vision grew dim, strength failed, had to be assisted to room. Could talk. Face very blue and swollen; ears especially cyanosed; eyes protuberant, with bloody tears; varicose, greatly distended and pulsating jugulars. Respiration only a little accelerated and noisy; constant effort to clear nostrils; voice like one with bad cold in head. Neck swollen, finally extremely engorged. No blueness or swelling of arms. Vomiting at times. Heart regular, normal. A murmur at second right costal cartilage with second sound; heard at first examination, but repeated auscultation afterward failed to find it again. Respiration somewhat bronchial and noisy. Pulse full, soft. No unconsciousness or paralysis at any time. Not even stupid until near end. Thirst constant. About two hours after first commencement had severe pain between scapulæ lasting until death. Patient lay down; later effort to rise produced some dyspnœa. All symptoms next increased in intensity. Finally, terrible attack laryngeal dyspnœa ended in death.

Duration of symptoms following rupture: 6 hours.

Autopsy: Cyanosis of face disappeared shortly after death. Lungs congested. Old adhesions of limited extent of pericardium to aorta. No pleural adhesions. A true aneurism of aorta extended from just above coronary arteries to innominate artery, where it became fusiform, and continued in transverse aorta to and including the opening of left subclavian artery. Aneurism 8 inches long on total convexity, 3 inches deep, $3\frac{1}{2}$ inches wide, involved chiefly right upper posterior part of vessel. In posterior wall a small lacerated opening apparently recently torn, leading into distal portion of vena cava close to innominate veins. Proximal portion of vein obliterated in sac-wall, except $\frac{1}{4}$ inch nearest to heart, which was patulous but narrowed. Left superior intercostal size of either innominate vein. No œdema of glottis found. Heart normal.

CASE XXIII.—Reported by Christianu. *Spitalul. Bucuresti.*, 1887, vii. 74.

Previous history: Saloon-keeper, aged sixty-one; intemperate; never syphilitic; previously always well. For some time cough, which became worse two weeks before seen; occurred in paroxysms which threatened suffocation; of late accompanied by severe pain in chest and swelling of neck. Examination showed some cyanosis and swelling of face, neck, thorax, and upper extremities. Swelling elastic rather than like œdema. Livid patches containing distended veinules. No murmurs; pulse strong, not accelerated. Respiration not accelerated; no dyspnoea. Dulness under right clavicle to third interspace and from middle line of sternum to 4-5 cm. to right of right sternal border. Some subcrepitant râles in lower part lungs. After three weeks somewhat improved and left hospital.

Symptoms following the rupture: Returned in two days with symptoms much aggravated and with orthopnoea. In one week more systolic murmur present, best heard in the region of the aorta, and in three days more both systolic and diastolic murmur, best heard in right supra-spinous fossa. Tremor of chest-wall, with thrill in third and fourth interspaces in front. Cyanosis, œdema, and dyspnoea increased and became extreme. Eyes projected and were bloody. Systolic murmur became so loud that could be heard on simply approaching ear to chest. Finally, restlessness, delirium, cyanosis of whole body, stertorous respiration, great œdema of nostrils, death by suffocation.

Duration of symptoms following rupture: 16 to 18 days.

Autopsy: Heart hypertrophied. Aorta and large vessels atheromatous. Aneurismal dilatation size of goose-egg from origin aorta up to transverse portion of arch. Vena cava adherent to sac, compressed, and a small perforation 1 cm. in diameter, with irregular edges, connected the vein and the aneurism. Azygos vein much dilated. Lungs, liver, spleen, and kidneys congested.

The exact time of the rupture in this case is not clear. If it occurred two weeks before the patient was first seen, the duration of the acute symptoms would be about seven and a half weeks. The fact that improvement occurred, and especially the possession of irregular edges by the perforation, as though it had been recently formed, indicate that the rupture most probably took place at the time the great aggravation of symptoms with the development of orthopnoea occurred.

CASE XXIV.—Reported by Gulliver. *Transac. Path. Soc. London*, xxxviii. 1887, 120.

Previous history.

Symptoms following the rupture.

Duration of symptoms following rupture.

[This was simply a card pathological specimen, unattended by clinical notes.]

Autopsy: Arch of aorta much dilated and diseased. At top of ascending portion was a circumscribed aneurismal dilatation which communicated with superior vena cava by a circular perforation size of goose-quill. Left internal jugular entirely closed by a clot, and the innominate at its termination had its lumen entirely obliterated by the pressure of the aneurism; and its opening into the vena cava was quite invisible. Cava elongated, being stretched by the aneurism.

CASE XXV.—Reported by Arkle and Bradford. *Brit. Med. Journ.*, 1888, ii. 1387; *Transac. Clin. Soc. London*, 1889, xxii. 69.

Previous history: Shoemaker, aged sixty-one; never rheumatism or syphilis; winter-cough for last six years; always well in other respects. Twenty months previously began to have pain in right mammary region of a dull, aching character; also dyspnoea, worse on the least excitement.

Symptoms following the rupture: About nine days before entering hospital seized with pain and swelling in neck. In a few days considerable swelling

of right arm. On admission was an almost black cyanosis of face, most marked on right side. Head and neck œdematous on right side, but little on left. Right arm greatly swollen and pitted. Chest slightly œdematous, especially on right side. Left side chest and left arm but little swollen. No œdema of lower portion of body. Some dilated veins along borders of sternum, and a ring of them horizontally around base of thorax. Respiration labored, accelerated. Paroxysms of coughing in which cyanosis was much increased. Some impairment of resonance in right infra-clavicular region in second and third interspaces, reaching the edge of the sternum. Visible pulsation in these interspaces. Numerous bubbling râles over chest. A thrill over the dull area, and a loud murmur. This murmur peculiarly harsh, continuous; loudest in systole; gradually diminishing in diastole; audible all over right infra-clavicular region, but maximum intensity in second right interspace some 2 inches from sternum. Apex in sixth interspace outside nipple-line; systolic murmur here not conducted into axilla. Aortic second-sound inaudible at base and apex. Cyanosis increased. Died suddenly.

Duration of symptoms following rupture: About 10 days.

Autopsy: A sacculated aneurism involved whole of ascending and greater part of transverse portion of arch; projected upward and to right; was flattened from before backward. Sac displaced right lung and reached surface of chest in second and third right interspaces. Superior vena cava lay behind aneurism and was compressed by it. About 1½ inches from commencement of vein, just above spot where it passed through pericardium, was a perforation into aneurism; diamond-shaped; ½ inch in diameter, with distinctly rounded edges. No appearance of any recent tear or rupture of any kind. Aortic valves insufficient; other valves normal. 1½ pints fluid in right pleural cavity, rather less in left.

CASE XXVI.—Reported by Kraus. *Prag. med. Wochenschr.*, 1888, 119, 130.

Previous history: Revenue officer, aged fifty-two; sixteen months previously began to suffer from cardiac asthma, with dyspnoea and pain in region of heart and in left arm. In following month noticed that neck and region of chin were swollen, and felt as though mucous membrane of throat was swollen. Respiration was through all this decidedly, though varyingly interfered with, though the attacks of asthma were less prominent. Gradually veins of neck swelled, and cyanosis of face developed. Six weeks before symptoms of rupture appeared the chest became œdematous and exhibited bluish spots and distended veins.

Symptoms following the rupture: Suddenly there occurred very severe attack of dyspnoea amounting to orthopnoea; palpitation of heart; præcordial anxiety; very deep cyanosis. Was brought on same day to hospital in this state. While under observation exhibited rapid, shallow, noiseless respiration, with attacks of dyspnoea; pulse small and rapid, but slower during asthmatic attacks, alike in both radials. On face, neck, and upper part thorax cyanosis, elastic œdema, and dilatation of veins. Eyes prominent. Noise in ears. Left arm œdematous, and later right arm also; hand and fingers not cyanotic. Lower half body not affected; no sharp line of demarcation. An indistinct pulsation to right of sternum from second to fifth rib; no distinct dulness here; a thrill from third to fifth rib on right side, which later disappeared and then returned. Apex-beat could not be distinctly located. Rough, blowing, systolic murmur, with maximum intensity in second right intercostal space; rather widely diffused, and heard in carotids. Examination of lungs negative, except some dulness in lower portion with faint bronchial breathing here and a few râles. Cyanosis, œdema, and attacks of dyspnoea varied, but finally grew worse. Œdema of larynx; of genitals; and slightly of upper parts of thighs. Sopor; hallucinations; unconsciousness; death.

Duration of symptoms following rupture: 40 days.

Autopsy: About 2 quarts fluid in each pleural cavity. Lungs congested; œdematous; lower portion atelectatic. Mitral and aortic valves a little

thickened; lateral leaflets of latter adherent to each other. Dilatation of whole ascending aorta beginning a finger's breadth above valves. 3 cm. above sinus of Valsalva of posterior leaflet was a secondary sacculated aneurism size of walnut; projecting from posterior and right side; in intimate contact with root of right lung, and displacing vena cava to right. Vena cava fused with sac and entirely obliterated for 4½ cm. above heart; above this much dilated. About opposite entrance of greatly dilated azygos vein were two smooth-walled perforations from cava into sac; the one the size of a pea; the other that of a hemp-seed.

The author believes that the rupture took place some time before the acute symptoms developed, and claims that the character of the perforation shows this beyond doubt. Other cases which we have abstracted prove, however, that the smoothing of the edges of a perforation takes place very rapidly, and that there is consequently no reason to believe that the rupture did not occur at the time at which the sudden increase of the symptoms would indicate.

CASE XXVII.—Reported by Sisley. *Lancet*, 1889, i. 1184. See also note by Ewart. *Lancet*, 1889, ii. 312.

Previous history: Laborer, aged thirty-five; temperate; scar on penis; rock-fever at Gibraltar; no history of accident. For some months cough, but no shortness of breath. Eyelids were puffy and face somewhat swollen on returning from work in evenings. This condition only seen at night, and had always disappeared by morning.

Symptoms following the rupture: On one occasion went to work, but, not feeling as well as usual, went into hospital for advice; though not considering himself seriously ill. Face and neck were deeply cyanosed; eyelids puffy and ears almost black. Arms slightly cyanosed; rest of body natural color. No pain; no paralysis. Mental state clear, but was drowsy. Pulse full, regular. Respiration not noisy or accelerated. Double murmur over middle of sternum; nothing else abnormal on physical examination of chest. After venesection a venous pulse was observed in jugulars and cephalic veins. Face and arms became gradually more cyanosed; respiration difficult and noisy, with expiratory stertor. Became more drowsy, and finally comatose. Died about two hours after admission.

Duration of symptoms following rupture: Less than 12 hours.

Autopsy: Saccular aneurism ¾ inch above posterior leaflet of aortic valve. Sac measured about 1½ inches in transverse diameter, and 2 inches from above downward. Was in contact with vena cava and right auricle. Vena cava quite patulous. Immediately above its entrance into right auricle was an opening into aneurism. This of irregular form, a little smaller than a sixpence, and with ragged edges projecting slightly into vein. Aortic valves not thickened. Right ventricle slightly hypertrophied. Lungs congested.

CASE XXVIII.—Reported by Gairdner. *Lancet*, 1889, i. 1233.

Previous history: Laborer, aged forty-four. For two years been conscious of slight degree of pulsation in neighborhood right sterno-clavicular region, which caused him no concern.

Symptoms following the rupture: Experienced a sensation as of something giving away near heart. No pain, but faintness and cold sweat lasting ten minutes; never recurred. Swelling of face and right arm followed, but had considerably diminished in degree when first seen after one week. At that time exhibited very marked cyanosis; general anasarcaous swelling of upper half body; some dilatation of small superficial veins all over front, especially in lower sternal region, extending thence to præcordial, right hypochondrial and right mammillary regions. Veins of hands distended, especially on left side. Very loud and characteristic murmur heard all over front of chest, but having mainly the distribution of aortic double murmur. The ventricular-

systolic element loudest at base, and diastolic element at least relatively loudest toward lower sternum. Some displacement of præcordial dulness downward and toward the left. Another and distinctly abnormal dulness, easily demarcated from the præcordial, occupied entire manubrium of sternum, and extended both to right and left; but its limits in former direction were difficult to state, owing to anasarca. Appreciable, but not very definite, pulsation in jugular fossa. A faint tracheal quality in respiratory murmur, as heard at upper sternum. Pulse rapid, decidedly stronger in right wrist than in left; in latter not abnormal, but in former had character of unfilled arteries. Pupils normal. But little cough. No signs of laryngeal implication. Respiration without difficulty at first; finally stertorous, but was no dyspnœa.

Duration of symptoms following rupture: 15 days.

Autopsy: Transverse portion of arch of aorta generally dilated, but with two more localized aneurismal dilatations; one extending to right, other to left. The first of these compressed superior vena cava and was adherent to it, forming a round bulging into interior of vein, corresponding to middle and upper third of this vessel. On summit of bulging a rounded perforation, $\frac{1}{4}$ inch in diameter and $1\frac{1}{4}$ inches below origin of innominate vein.

CASE XXIX.—Reported by Pepper and Griffith in this communication.

A review of the salient features of these cases and of the one now reported shows that in many instances the diagnosis is easily possible during life, while in others it is perhaps impossible. A correct diagnosis was, in fact, made by Mayne and by Glasgow, in their respective cases (VII. and XIX.): Gull, in the case reported by Eastes (X.), recognized an abnormal intra-thoracic venous communication, perhaps with an aneurism; and Gallard in his first case (XI.), as well as in that reported by Bonnardel (XV.), diagnosed an aneurism of the aorta, and discussed the probability of there being a communication between it and the superior vena cava. Damaschino and Lavin made, with apparent reason, the diagnosis of the affection in their case of recovery (XVIII.).

The recognition of the presence of varicose aneurism of the aorta and superior vena cava may be based upon the following principal symptoms, deduced from a study of the different reported cases:

1. *Cyanosis, œdema, coldness, and distention of the veins of the upper part of the body, with other evidences of obstruction to the circulation of blood in the tributaries of the superior cava.* These symptoms have been present to a greater or less degree in all the reported cases of which clinical histories are given, and their diagnostic indications are evident. No lesion could produce such a condition, with its peculiar localization, except some great obstruction to the course of the blood in the superior cava. The thorax, however, does not always share the lividity and œdema of the head and arms; this variation depending solely on the position of the perforation or of the compression. If, namely, the obstruction in the cava is situated below the point of entrance of the azygos vein, the chest will share in the venous congestion; if, on the other hand, the obstruction is above the azygos vein, the removal of blood from the chest-wall is not interfered with, and no œdema develops. In certain

cases the reason for the absence of thoracic œdema is not entirely clear, and often depends on the lack in the published report of a sufficiently detailed statement regarding the exact position of the obstruction in the cava. When the thorax is involved, there is sometimes a sharp line of demarcation between the upper affected and the lower unaffected portion of the body, marked by the numerous small varicose veins around the lower part of the thorax. It has happened more than once that a patient has shown a greater degree of œdema on one side than on the other. This condition may be produced in several ways. For example, in the case of Arkle and Bradford's (XXV.) a long-standing obliteration of the left innominate vein had allowed the establishment of the collateral circulation, so that the sudden rupture of the aneurism produced œdema almost limited to the right side. A similar unilateral œdema and cyanosis of the upper portion of the body would be produced by communication of an aneurism with the left innominate vein, as seen in the case reported by Chabond (*Lyon Méd.*, 1873, No. 26; *Virchow-Hirsch Jahrb.*, 1873, II., 147). Another case illustrating differences in the swelling of the two arms is that of Cossy's (VI.). In this the opening into the aneurism from the vena cava was situated close to the bifurcation of the cava, in such a position that the blood-current was directed into the right innominate vein, producing consequently much greater swelling of the right arm. In some other instances the causes of the slight differences observed are not apparent. When death has very rapidly followed the rupture of the aneurism there may have been no time for œdema and lividity of the arms to develop. This was the condition in the case reported by Shannon (XXII.), in which only the face and neck gave evidence of the change. The onset of the symptoms in this instance was extremely sudden, and death occurred in six hours.

The cyanosis is probably not due to the admixture of arterial and venous blood; otherwise we should see it well marked in cases of rupture of an aneurism into the pulmonary artery. It depends simply on obstruction from compression by the aneurism, and from the backward pressure of the arterial blood into the vein. In the patient of Christinu's (XXIII.) the whole body finally became cyanosed.

Slight œdema has in some instances been witnessed in parts of the lower portion of the body, though always secondary to that above. Thus, in Thurman's patient (II.) there was slight œdema of the ankles and scrotum, and in Schnaubert's (XVI.), Halla's (XVII.), and Kraus's (XXVI.), of the genitals, hips, and upper parts of the thighs. In the case of Glasgow's (XIX.) there finally developed general œdema. Œdema of the lower portion of the body in these cases is due, according to Halla, to the overfilling of the inferior cava through the necessity which it is under of receiving a large part of the blood belonging to the superior cava. This same passive congestion explains the scanty secre-

tion of urine which has been noted in a number of instances. In a considerable number of cases large amounts of fluid have been found in both pleural cavities, while in other instances there was none. The difference undoubtedly depends largely on whether or not the circulation in the azygos vein is interfered with.

Besides the cyanosis and œdema, dyspnœa may be present, either from the outset or later in the disease. In our own case it was intense, as it was in a large number of others. In others, again, it was absent, or slight, or not referred to by the writer. Thus in Cossy's patient (VI.) it was slight, and in Gairdner's (XXVIII.) nearly absent, and it does not appear to have been well marked in the case of Hayden's (XII.). It is not at all essential that dyspnœa be present, as it is in the event of rupture of an aneurism into the pulmonary artery. Its development depends on various factors, such as double hydrothorax with consequent compression of the lungs; œdematous swelling of the mucous membrane of the nose, pharynx, trachea, larynx, and bronchi; œdema of the lungs; pressure by the tumor on the respiratory tube; over-filling of and consequent irritation of the nerve-centres with venous blood. In Shannon's case (XXII.) death was directly due to an attack of extreme laryngeal dyspnœa.

Still other symptoms indicating venous obstruction may be seen. Cough is a frequent and natural attendant on the dyspnœa, and râles of various sorts are often heard. There was sometimes expectoration, and not infrequently it was tinged with blood, as, for example, in the case of Thurman's (II.), Halla's (XVII.), Schnaubert's (XVI.), and of Damaschino and Lavin's (XVIII.). In our own case a considerable pulmonary hemorrhage took place, due, probably, to an erosion of the trachea by the aneurism. Thurman claims that the dyspnœa, cough, and other evidences of pulmonary congestion, witnessed during life or after death, are due to the circulation through the lungs of an admixture of arterial and venous blood, and the resulting irritation by it of the bronchial mucous membrane.

In some cases there has been difficulty in swallowing, probably due either to pressure of the aneurism on the œsophagus, or, in other instances, no doubt, to the excessive distention of the tissues of the neck with serum. Bloody tears were seen in Shannon's patient (XXII.), and blood oozed from the conjunctivæ in our own case, and in that of Christianu's (XXIII.). A not infrequent symptom as the end approaches is a marked tendency to sleepiness, and, finally, coma. In some cases delirium was present before the coma developed. Attacks of faintness have also been reported, as in the case of Goupil's (VIII.). In a few instances (IV., IX., XIV., XXIII.) excessive restlessness was noted. Headache, too, is naturally present at times. In Kraus's case (XXVI.), and in that of Schnaubert's (XVI.), there was noise in

the ears, and in Cossy's patient (VI.) annoying and persistent noise in right temple and ear, a sense of painful tension in the head, and giddiness. Giddiness was observed in a number of other cases. Convulsions were uncommon, though they occurred shortly before death in Mayne's patient (VII.). Pain in the chest was sometimes observed, and in some instances was among the first symptoms appearing. Coldness of the upper portion of the body is a very common symptom. The temperature-chart of our own patient is an illustration of this fact.

2. *The suddenness of onset of the symptoms.* With the recognition of impeded return of blood through the superior cava the diagnosis is by no means made. Obstruction to the flow of blood in the cava from various other causes may, as already stated, produce the same symptoms. Still, the comparative suddenness of their development in cases of varicose aneurism constitutes a most valuable diagnostic sign. This rapid development was seen in all the cases in which the mode of onset is reported. Sometimes it was exceedingly abrupt. For example, in the case of Shannon's (XXII.) the symptoms were intense, and immediately followed a degree of excitement. Young's (IV.), Tripier's (IX.), and Gallard's (XI.) patients were suddenly taken during the night with very severe symptoms of the rupture. The patient of Law's (V.) became cyanosed and swollen without any premonition while lying down after a morning walk. Cossy's patient (VI.) woke in the morning with evidences of the rupture; Mayne's (VII.) was stooping; Jacoby's (XIII.) was leaning over his drawing; Farrington's (XIV.) had just been brought from the clinic in a state of great excitement; Halla's (XVII.) Damaschino and Lavin's (XVIII.), and Glasgow's (XIX.), were lifting heavy weights; Wetterdal and Wallgren's (XX.) was also putting forth violent exertion. In certain other cases no history of at least such a very sudden and alarming beginning is given, and sometimes it clearly was absent. Thus, in the case reported by Sisley (XXVII.), though the onset seemed to have been sudden, the patient was not aware of any great change in his condition. How long a time was actually required for the symptoms to develop in Eastes's case (X.) is not stated, nor is it entirely clear in the cases of Christianu's (XXIII.) and Kraus's (XXVI.). In Thurman's patient (II.) several days seem to have been needed for the swelling and cyanosis of the face to become apparent, and the same is true of Arkle and Bradford's patient (XXV.). In Hayden's case (XII.) it is not stated that there was any sudden onset so far, at least, as known to the patient. In our own case it could not be ascertained with just what rapidity the symptoms arose, but it is certain that they were not long in developing.

It is quite evident from a study of these cases that there is no instance reported in which there is an account of simply a very gradual increase

in the gravity of a previously existing condition. Only a few days at the most were necessary for the characteristic symptoms to appear.

The rapid development of symptoms is not, however, absolutely pathognomic of rupture of an aneurism into the vena cava, although it renders the fact of its occurrence extremely probable; for, although simple compression of the cava is usually slow in its onset, the symptoms may exceptionally make themselves known with comparative rapidity. A case is reported by Dujardin-Beaumetz (*Gaz. Heb. de Méd.*, 1879, 2 s., xvi. 19-23,) in which extreme venous congestion was produced in the course of ten days, the cause being compression of the superior vena cava by an aneurism, and the development of a clot in the greatly dilated azygos vein, in which the collateral circulation had previously been carried on. He admits that he has been unable to find any other case recorded in which the symptoms came on so rapidly. There is an instance, however, reported by Duchek (*Prag. Vierteljsch. f. Prak. Heilk.*, 1854, xli. Also *Handb. spec. Path. u. Therap.*, 1862) in which rapid development of the symptoms of obstruction was probably due to the sudden production of a thrombus in the cava. The rapid formation of a dissecting-aneurism could also by compression quickly produce symptoms of venous obstruction.

In many cases symptoms indicating a degree of obstruction had existed for months or years before the rupture took place. Sisley's patient (XXVII.), for example, had had for some months swelling of the face, which came on after the day's work; and in Mayne's case (VII.) swelling of the eyelids, face, and hands, and dyspnoea, were produced by working. Gairdner's patient (XXVIII.) had been conscious for two years of pulsation in the right side of the chest. In Kraus's patient (XXVI.) there had been for sixteen months very evident and persistent œdema of the neck and throat, and later cyanosis as well. Dyspnoea, cough, and palpitation, and sometimes pain, had been noticed in a large number of cases. In Farrington's patient (XIV.) there had been for a year a small tumor in the right chest, presumably an aneurism. In our own case the previous existence of dilated veins upon the thorax was the only indication of the earlier presence of the aneurism. The existence of such symptoms, followed by a rapid and great increase in their severity, or by the accession of new symptoms, would indicate that some great and sudden change had taken place in the condition of the thoracic viscera—the most probable being, of course, the rupture of an aneurism. Many cases begin without previous symptoms. These would equally point to some great change in the thoracic contents.

3. *Evidence from physical examination of the presence of a tumor in the thorax, and the probability that this is aneurismal.* No reference is had here to the murmurs found, as these will be discussed separately. If the presence of an aneurism is confirmed in this way, in addition to the

indications already described, the diagnosis of rupture into the superior cava becomes greatly strengthened. In our own case the physical signs discovered in the chest were for the most part inconstant and contradictory, owing to the interference presented by the great œdema of the thoracic walls. One symptom, however, was nearly always observed, viz.: a degree of dulness below the right clavicle and under the upper portion of the sternum. A review of the reported cases shows that a percussion-dulness, occupying this same region, was frequently present. Not uncommonly this centre of dulness exhibited a thrill, usually systolic in time, though in one case (Case X.) diastolic. Thrill could sometimes be felt elsewhere, also. Thus, in Mayne's and Cossy's cases (VII. and VI.) a purring tremor could be felt in the internal jugular and subclavian veins on the right side. A pulsation was present over the centre of dulness in many instances, but absent in more. Mayne (VII.) and Glasgow (XIX.) describe it as strong and heaving, and in most of the cases where it could be felt at all it was well marked, and oftener stronger than the cardiac impulse. In some cases, as in those of Hayden's (XII.), Turner's (XXI.), Kraus's (XXVI.), and Schnaubert's (XVI.), it was indistinct or feeble. In Farrington's patient (XIV.) there was a distinct pulsating tumor visible to the right of the sternum from the second to the fourth rib. In our own case neither thrill nor pulsation could be felt. Mayne (VII.) and Glasgow (XIX.) describe the pulse as jerking, like that of aortic regurgitation, and consider it an additional proof that an aneurismal tumor is present. Gairdner (XXVIII.), also, refers to the pulse as that of unfilled arteries. In a number of instances it is reported as small and feeble, but there appears to have been nothing characteristic about it. It is sometimes stated to have been stronger in one wrist than in the other. Undoubtedly the difference has depended upon the varying degree of œdema of the arms, or some such factor, since aneurisms of the ascending portion of the arch would not produce this inequality. A venous pulse, as seen in the case of Cossy's (VI.) and of Sisley's (XXVII.), is a very valuable indication of the presence of a varicose aneurism. The existence in any case of such well-recognized symptoms of aneurism as dulness on percussion, thrill, and pulsation, together with the symptoms previously described, render the diagnosis very probable.

There remains to consider the last of the evidences of varicose aneurism:

4. *The existence of a murmur characteristic of a communication between an artery and a vein.* When this murmur is present the existence of a varicose aneurism becomes practically a certainty. Thurman first explained the nature of this murmur as occurring in spontaneous varicose aneurisms of the aorta, and dwelt upon its diagnostic importance, though

it was not present in the case of aneurism of the aorta and superior vena cava reported by him (Case II. of this series, IV. of his own). Its extremely loud and distinct character is due to the small size of the opening. The chief feature of the murmur is that it is *continuous*, this being due to the fact that the passage of blood from the aorta into the cava is a continuous one. During the systole the pressure is at its height, and the sound is consequently loudest and highest pitched. During the diastole the current from the artery to the vein depends on the elasticity of the arterial system acting upon the contained blood. The murmur is, therefore, still audible, though continually growing fainter and lower pitched; until the next systolic intensification. A perfectly typical murmur of this nature was present in our own case. It was also observed in the cases of Eastes's (X.), Jacoby's (XIII.), Arkle and Bradford's (XXV.), and Damaschino and Lavin's (XVIII.). In the first it is described as a soft, whizzing, very distinct murmur of a venous character, both diastolic and systolic, with its maximum intensity at the third right costal cartilage. It constituted a continuous churning sound, like that heard in the enlarged vessels of a thyroid gland. In Jacoby's case there was a loud, continuous, buzzing murmur, loudest with the systole, and heard best at the second right costal cartilage. In the case reported by Arkle and Bradford the continuous murmur was peculiarly harsh, loudest in the systole, and heard under the right clavicle, though the maximum intensity was in the second right interspace about 2 inches from the sternum. Finally, the diagnosis made by Damaschino and Lavin depended largely on the perfectly continuous murmur, heard loudest $3\frac{1}{2}$ c.m. below the middle of the right clavicle. It was very intense, and had a systolic reinforcement, and was remarkable, especially during the systole, for its peculiar sonorous and vibrating character.

A continuous murmur would seem almost necessarily to owe its existence to a varicose aneurism. Neither a simple aneurism nor any form of valvular disease could produce the continuous sound, since there would need be a short interval between the systolic and diastolic portion. In our own case the peculiar continuousness of the murmur was noted, as well as the fact that its quality was distinctly venous. The effort was made to explain it on the ground that there existed an aneurism of the aorta pressing upon the cava and producing a murmur in it; and that during the cardiac systole the aneurism expanded and the pressure became greater. Consequently, the pitch of the murmur was elevated, since the lumen of the vein was made more narrow. This explanation was, we admit, fanciful, and, as the event showed, faulty. In fact, it was impossible that it could have been correct, since the increased pressure during systole would have diminished the intensity of the murmur, even though it elevated the pitch. That the peculiar continuous

murmur is pathognomonic of a varicose aneurism was recognized and maintained by Thurman. Mayne and Cossy equally urge its diagnostic value, though showing by their own cases that the symptom is not an essential one. In each the murmur was systolic only, which the writers explain on the ground that the very marked disease existing in the arterial walls interfered with the arterial contraction during the cardiac diastole, and in this way produced the absence of the diastolic part of the murmur. In fact, in several other cases (VI., VII., IX., XV., XVII., XXVI., and probably II.), only a systolic murmur could be heard, and in still more (III., VIII., XI., XII., XIV., XVI., XIX., XXI., XXIII.), there was a distinctly double murmur, with an interval between the two parts. It is therefore evident that the continuous murmur is not an essential symptom of varicose aneurism, though such a valuable sign when present. The maximum intensity of the murmur, of whatever nature, was nearly always on the front of the chest, in the neighborhood of the first portion of the arch of the aorta, or over the abnormal centre of dulness. The only exception was the case of Christianu's (XXIII.), in which the maximum intensity of the double murmur was situated in the right supra-spinous fossa.

The method of the production of these different murmurs in the different cases is not at all clear. Sometimes they may have been due to the passage of blood through the perforation, audible only during a portion of the cycle; at other times they may have been produced in the aneurism or in diseased aortic valves. It is a noteworthy fact that in certain instances the signs of aneurism were very meagre. In the cases, namely, of Young's (IV.), Law's (V.), Wetterdal and Wallgren's (XX.), and Sisley's (XXVII.), there was neither thrill, dulness, nor murmur discovered, and in the last three no pulsation. Shannon's patient (XXII.) exhibited a diastolic murmur at the first examination, but after this no physical signs of aneurism could be found. In the case reported by Beevor (I.) no description of the physical examination of the chest is given, and that reported by Gulliver (XXIV.) was only a card pathological specimen, unaccompanied by clinical details.

AUTORSY.—Little need be said under this heading since the most important character—the perforation—was, of course, present without exception. The shape of the perforation in the different cases was slit-like or more circular; its size never very great—half-inch or so in length or in diameter—and sometimes quite small. In some cases the edges were irregular and ragged, but oftener they were to a certain degree smooth, showing that in a comparatively short time after the rupture this smoothing can take place. In Glasgow's case (XIX.) the perforation was found closed by a thick plate of laminated fibrin. A fact worthy of note is that in nearly all the cases it is directly stated that compression of the cava existed as well as perforation. In Turner's case

(XXI.) the cava was completely divided by the aneurism, so that the distal portion looked like a short arterial trunk given off from the aneurism at its upper border. In our own case the production of this separation was well under way when the patient died. In Reid's case (III.) the perforation involved also the upper part of the right auricle, at the position of entrance of the superior cava. Another most important feature bearing on the production of murmur in aneurism in general is, that in only 5 cases (IV., XIV., XXI., XXV., XXVI.) is disease of the aortic valves described.

DIAGNOSIS.—Enough has been said about the characteristic symptoms. There is no condition with which the disease could be confounded except that of remarkably sudden obstruction of some other nature to the passage of blood in the vena cava, and such cases are almost hypothetical. From other varicose aneurisms of the aorta the diagnosis is easy. Rupture of an aneurism into the right ventricle or right auricle would produce general cyanosis and œdema. Rupture into the pulmonary artery could not produce the characteristic localization of œdema and cyanosis. The murmur would be heard at the left edge of the sternum instead of at the right edge. The dyspnœa would probably be intense, and symptoms of engorgement of the lungs would eventually be followed by general anasarca, as in mitral disease.

PROGNOSIS.—As the reported cases show, the prognosis is most unfavorable. Death has supervened in every case but one. In Shannon's patient (XXII.) only 6 hours elapsed before the fatal issue; in the case of Farrington's (XIV.) 13–15 hours; in that of Wetterdal and Wallgren's (XX.) less than 24 hours; and in that of Sisley's (XXVII.) less than 12 hours. On the other hand, patients may live days, weeks, or even months. Our patient lived 7 weeks; that of Kraus's (XXVI.) 40 days; that of Thurman's (II.) 2 months; that of Turner's (XXI.) 23 weeks; that of Glasgow's (XIX.) 7 months. In this last case the patient, after one month, seemed about to recover; then grew worse, and died. The patient of Damaschino and Lavin's (XVIII.) was living and practically well at the time the report was published. Although the murmur remained the same, collateral venous circulation had become established about one month after the onset of the symptoms, and œdema and cyanosis had about disappeared. The permanent recovery in this case, and the temporary improvement in Glasgow's case, indicate that the disease is not necessarily fatal, though the favorable chances are very slight.

TREATMENT.—This has proved useless. Venesection is the method which has been most frequently employed, but never with permanent benefit. Cupping, wet or dry, and free purgation may be employed. The strength should be sustained as far as possible, in the hope that the collateral circulation may become established, if the perforation be not too large, or that the opening may become closed by a thrombus.

REMARKS ON THE DIAGNOSIS OF DIVERGENT ENTERIC FEVER.

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ENTERIC fever is a common disease. Yet its diagnosis is by no means always easy. And this is in spite of the fact that it has been carefully studied by such masters as Wunderlich, Griesinger, Trousseau, Jaccoud, and Murchison. As a result, however, of the investigations of these and others, our conceptions of typhoid fever have crystallized into a very definite form.

Now the majority of cases, in a district in which typhoid is endemic, justify the accurate and lucid rules laid down for the diagnosis of the condition. Yet, even in the midst of a series of normal cases, ever and anon one will arise which presents marked differences. With such divergence we are familiar, and it has led to special names, such as abortive typhoid, ambulatory typhoid, and slow, nervous typhoid.

I question, however, whether the line of demarcation between the different classes is sufficiently distinct to render advisable any attempt to distribute them into separate types. For if modifications be accepted as separate forms, then the floodgates will be opened to many other varieties. And we may have to accept, among other types, a bilious, mucous, renal, pneumonic, spinal, cerebro-spinal, adynamic, and malignant form of enteric fever. But such names are of little value beyond expressing a prominent train of symptoms.

Moreover, typhoid fever may occur in association with measles, scarlet fever, malarial fever, meningitis, and various neuroses. If these also be considered as types, then we may have to admit the existence of actual hybrids, such as measles-typhoid and scarlatina-typhoid. But there is no evidence that such occur.

The occasional profound modifications in its course to which typhoid is liable do not result from hybridity. They depend partly upon the idiosyncrasy of its host; but other co-existing morbid factors may play an important part. Thus it comes to pass that sometimes enteric fever presents great difficulties to diagnosis—its true characters being either masked by adventitious symptoms or obscured by deviations from the normal. It is true that in most cases the time comes when the patient's condition approximates more or less closely to the "typhoid" state. But there is some danger even then of confusing it with the later stages of various diseases accompanied by prolonged fever.

We may at once grant that a very large number of modifications may

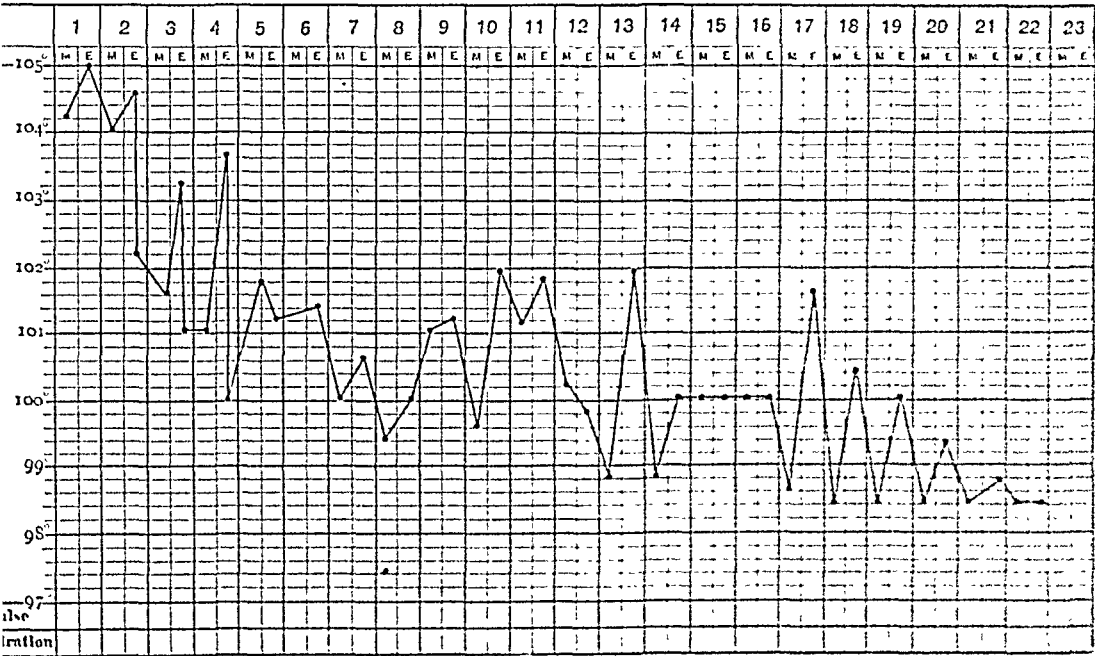
exist without hiding the true nature of the disease from a highly-skilled and experienced observer.

Again, not unfrequently, collateral facts assist in diagnosis. For example, in 1885, in the space of a few weeks, I attended seven cases of typhoid fever in one house in a part of Edinburgh in which the disease was endemic. Most of these were very well marked and typical cases. One patient, however, was only ill for three days and in bed one. Under the circumstances the symptoms were easily and probably correctly interpreted as a very mild attack of endemic fever. We know that attacks of this nature do occur, not only in typhoid, but in diphtheria, smallpox and other exanthemata. Such cases are, however, extremely apt to escape recognition unless occurring in the course of an epidemic or a well-pronounced endemic.

In sporadic cases the difficulties of diagnosis are greater.
1. When a patient comes under the care of the physician there may be doubt as to how long the disease has been in progress. This is illustrated by the following case:

Miss A., aged twenty-four years. On March 27, 1889, was well enough to take a ride (for pleasure) of eight miles, but complained of feeling unwell in the evening. On March 30th, when seen, she was suffering from high fever. The subsequent course of the temperature is shown in Chart 1.

CHART 1.



Typhoid fever; well advanced when first observed.

The rash appeared on the eighth day, increasing till the twelfth. From the fifteenth it diminished. On the twentieth day no spots were left. There was characteristic diarrhœa. During the first two days the pulse ranged from 125 to 130. On the evening of the second day it was 102. Subsequently it fluctuated between 85 and 100, being usually higher in the evening. On the fifteenth day it came down to 76. From this time it increased and diminished with the temperature. No anti-pyretics were administered after the fourth day.

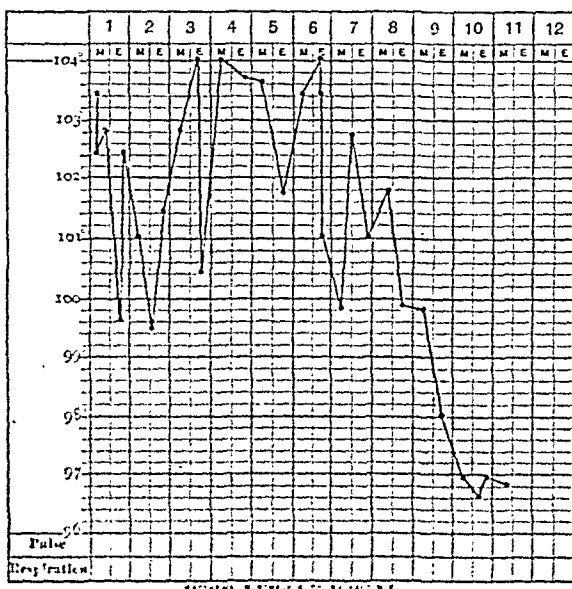
This case is by no means so abnormal as would appear at first sight. Probably the first observation recorded was the temperature, *not of the first day*, as marked on the chart, *but of the fifth or sixth*. The patient admitted having suffered from fever during the preceding week, although she had not been unable for work.

In a case of sporadic enteric fever the following divergences from the normal may be very misleading:

- (a) Unusual temperature-course.
- (b) Absence of usual symptoms and signs.
- (c) Addition of new unusual symptoms and signs.
- (d) Combinations of the above.

I will now describe briefly a few cases illustrating these divergences:

CHART 2.



Typhoid fever, abnormal temperature.

(a) *Unusual temperature-course.* R. M., male, aged two years. Had resided in India and suffered from occasional fever—probably of malarial origin. No distinct period of incubation. The child was apparently quite well on the previous day. Chart 2 gives a complete

view of the fever; but, for the sake of clearness, usually only one or two morning and evening temperatures are represented for each twenty-four hours. Typical, rosy, lenticular spots appeared on the fourth day over the abdomen. On the sixth day more spots were observed—some on the chest and back. On the tenth day the spots were fading away. There was diarrhoea, with at first from two to three motions daily. From the eighth day the motions were formed. For the first six days the pulse ranged from 130 to 140. The respiration fluctuated between 50 and 60. For the first three days it was irregular in type, with three or four deep, followed by many shallow, quiet respirations. On the sixth day there were symptoms of very slight bronchitis.

Obviously the administration of antipyretics tends to upset the temperature-course characteristic of typhoid. This adds to the difficulty of diagnosis. But it is a difficulty which must be faced, because it is one which must necessarily arise. It is unfortunate, to say the least, for a physician to be compelled to withhold treatment because his diagnosis is delayed.

In the above case, two grains of antipyrine were administered on the *first* day at 8.45 A. M., 12.5 P. M., and 3.5 P. M. On the *second* day three-grain doses were taken at 1 A. M., 10.15 A. M., 3.35 P. M., 7.45 P. M., and 10.30 P. M. On the *third* day, at 2.30 A. M., 6.30 A. M., 9.30 A. M., 12.30 P. M., 3.30 P. M., 7 P. M., and 10 P. M. On the *fourth* day, at 1.45 A. M., 5.40 A. M., 12 noon, and 10 P. M. On the *fifth* day, at 8.30 A. M. only. On the *sixth* day, at 4.35 A. M. and 2 P. M. On the *seventh* day three grains of antipyrine were given at 4.30 P. M. only.

On the sixth and seventh days a cold pack was administered respectively at 11 A. M. and 4.30 P. M., the time of the highest temperatures. From the seventh day onward no packs or antipyretics were employed.

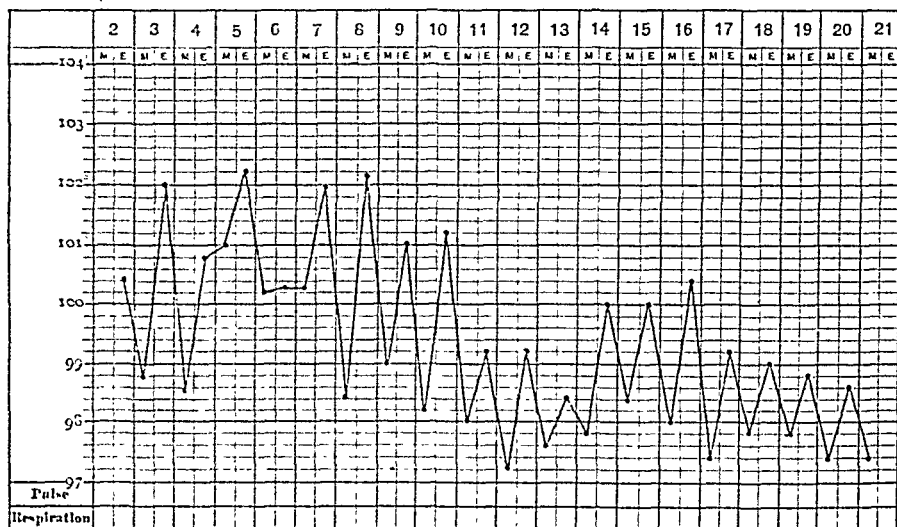
The periods of highest and lowest temperatures are interesting.

DAY.	HIGHEST TEMPERATURE		LOWEST TEMPERATURE.	
	Time.	Record.	Time.	Record.
1	1 A. M.	103.4°	6 P. M.	99.7°
2	12.45 P. M.	102.6	3.30 P. M.	99.6
3	7 P. M.	104	8.30 A. M.	98.8
4	5.30 A. M.	104	7 P. M.	101.7
5	8.30 A. M.	103.6	9 P. M.	100.9
6	11 A. M.	104.4	6.30 P. M.	100.4
7	4.30 P. M.	102.7	9 P. M.	98.2

On the fourth day the temperature was as follows: 1.30 A. M., 103° F.; 5.30 A. M., 104°; 6.45 A. M., 102°; 10 A. M., 100.2°; 11.45 A. M., 103.4°; (12.15 P. M. cold pack); 1.30 P. M., 100.8°; 3.45 P. M., 101.8°; 7 P. M., 101.7°; 9.15 P. M., 103.7°; (10 P. M. cold pack); 12 P. M., 99.8°.

(b) *Absence of usual symptoms.* Mrs. C., aged about forty years; illness began on April 30, 1889, with rigors and fever. For several days previously she had not been well. Still, on May 1st she was able to get about. The course of the temperature is indicated in Chart 3.

CHART 3.



Low continued enteric (?) fever.

It will be seen that neither in the morning nor in the evening temperature was there regular progression or characteristic exacerbation. By the thirteenth day both the morning and evening temperatures had reached the normal. From then till the twentieth there was an evening exacerbation—the morning temperature always remaining normal or subnormal. Typhoid symptoms can hardly be said to have existed. There was no rash. Occasional laxatives were required. Small doses of quinine were administered regularly. And from the eighth to the sixteenth day Fowler's solution was taken. During the latter part of the second week the patient had slight abdominal tenderness. Her appearance then was that of a typhoid patient. The exacerbation on the fourteenth day corresponded to a slight increase of diet—a little toast having been allowed. The toast was stopped on the seventeenth day.

It will, I think, be admitted that in this case, whatever the probabilities may have been, the evidence was not sufficient to justify a positive opinion either for or against enteric fever.

(c) and (d) *Addition of new unusual symptoms and signs, with complications.* Mrs. D., aged fifty-five years, was first seen on January 5, 1890. She was complaining of intense pain in the left lumbar region, suggestive of renal colic. There was the faintest trace of albumin in the urine, but no gravel or pus.

There was a history of much trouble and mental wear and tear due to

heavy pecuniary losses. A similar pain in the side had often existed before and was apt to be worse at intervals of a month. There was a distinct neurotic history of the so-called "hysterical" type. Associated with the pain was insomnia of so high a degree that two drachms of paraldehyde divided into three doses and given in one night failed to procure sleep. For a few nights the irritability and mental excitement were great and the patient manifested a dislike to her husband, of whom she was really fond. These symptoms improved much subsequently. Mrs. D. was rather difficult to manage, being anxious to treat herself with old prescriptions, of which she had an immense collection. There was nothing to be detected at the site of the pain, which was not increased on deep pressure if the attention was diverted. The patient's manner was profoundly hysterical (I use the word in the medical and not the popular sense), and this tendency was further betrayed in various ways, such as misstatement of facts relating to food, medicine, sleep, and the condition of the bowels. Yet the mind was clear and she talked intelligently. There was no delirium or fixed delusion. There was never any headache or impairment of vision. On the evening of the seventeenth day of illness a hysterical fit occurred affecting the left side chiefly and followed by a transient condition of somewhat plastic rigidity of the extremities on both sides. The pupils were unaltered. On the evening of the twenty-third day (January 28th) there were some slight convulsive twitchings of the face and muscles of the upper extremities. And about this time pain was complained of in the right heel. If this latter was pressed, then pain was complained of in the left lumbar region.

From the commencement of the illness and to a greater or less extent throughout, there was a nervous urinary affection. First, retention—never associated with distention, and subsequently great irritability, shown by frequent micturition, usually much worse at night—sometimes twice or thrice in an hour. On one occasion, when the catheter was used to make sure there was no retention, only one ounce of urine was found in the bladder, but the irritability was much less for several hours following. When the nurse was in the room micturition was more frequent. But if no one was present the urine was often passed into the bed.

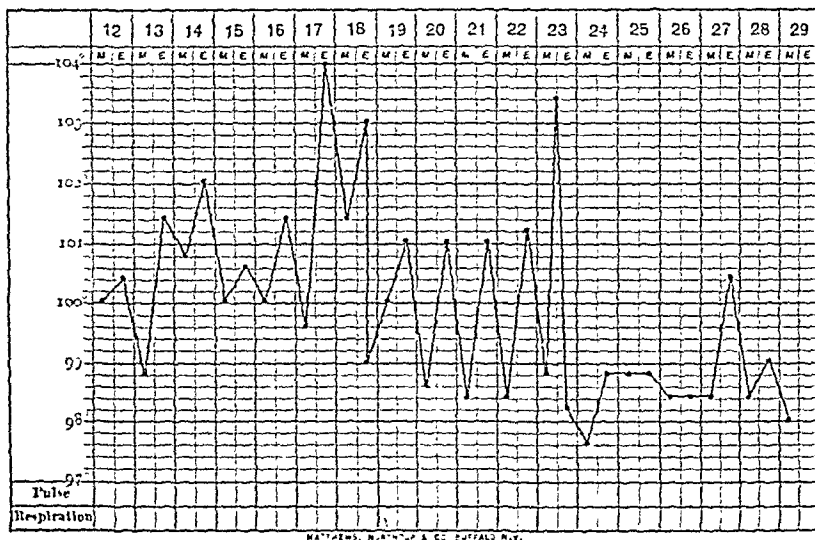
During the third week paresis of left arm and leg was complained of. This was purely functional and temporary. At one time there was a transient numbness of the left ring-finger. Coördination was never impaired. The dorsal decubitus existed throughout, but no bedsores formed. The face was pale.

During the first ten days the temperature was never found above 101° F.

From January 16th to 21st (twelfth to seventeenth day of illness) the lowest point reached was 98.8° (in the mouth) on the morning of January 17th, and the highest point was 102.2° on the evening of January 18th. Sometimes there was half a degree of difference between the morning and evening temperature, and sometimes two and a half degrees. On the evening of January 21st (seventeenth day of illness) the temperature rose to 104.2° F., at which period the fit occurred. From January 23d to 27th (nineteenth to twenty-third day of illness) the morning temperature was normal and the evening temperature regularly two degrees higher. An exception to this was the afternoon of January

27th, when there was a rise to 103.4° . From this time till February 2d (twenty-ninth day) both morning and evening temperatures were normal or subnormal, except for a rise to 100.4° on the evening of January 31st (see Chart 4).

CHART 4.



Divergent enteric fever complicated by hysterical and other unusual symptoms.

The pulse ranged from 90 to 108; sometimes it was higher in the morning than the evening. But usually the reverse was the case. Generally the quality was good. Sometimes, for a few hours, there was dicrotism. On February 2d, at 4.30 A. M., when collapse had set in, the pulse-rate increased to more than 116 and was thready.

Respiration varied from 30 to 25. It was usually, but not always, higher in the evening. On the evening of February 1st the respiration was 30, but at 4.30 A. M., February 2d, was 50. During the last few days of the illness there were slight bronchial symptoms.

The patient had been in the habit for years of taking frequent purgatives. The tongue was clean till about January 21st, when it began to get rather brown at the centre with red edges and tip. The lips were clean and fairly moist. In spite of breathing through the mouth there was great freedom from sordes. The bowels were confined, and castor oil and salines were frequently required. During the last forty-eight hours there were seven loose motions.

From the twenty-fourth to twenty-sixth days (January 28th to 30th) favorable hopes were entertained of recovery. But the diet was not altered. On the twenty-seventh day (January 31st) there was pain in the epigastrium. On the evening of February 1st this was worse, and, coupled with a rise in the respiration, occasioned anxiety.

During the last week there was some tumidity of the abdomen. There was no enlargement of the spleen to be detected by palpation or percussion.

Death took place on the morning of February 2d (twenty-ninth day) rather suddenly. Symptoms of profound collapse appeared in the early

morning. There was some doubt whether they followed the use of the bedpan. The condition of the patient pointed strongly to perforation. It is just possible that there was reflex paralysis of the vagus.

The sad and rapid termination of the disease, taken in conjunction with the other symptoms, appears to indicate that this was really a case of enteric fever.

The possibility that it was typhoid had been discussed in consultation during the third week. But it was felt that there was not sufficient evidence to warrant such a conclusion. If recovery had ensued, when the intermission occurred, from the twenty-fourth to the twenty-sixth day of the disease, the diagnosis must have remained doubtful.

Such cases as this emphasize the necessity for breadth in diagnosis. Of recent years immense advances have been made in the accurate noting and recording of details of disease and in the observation of minutiae. Perhaps there is a tendency for the consideration of history and of facies, manner, and all that go to make up "temperament," to receive rather less attention. To borrow an analogy from portrait-painting, the finer touches and chiaroscuro of a disease are sketched in unerringly, while the broad lines, on which likeness depends, are treated with less skill.

One important aid to the diagnosis of enteric fever is undoubtedly the recollection that the strain of a general blood-poison may be felt, not in the usual seat of election, but in the weakest part of the organism. Thus in a patient of neurotic predisposition the nerve-vitality defences may be broken down and a large proportion of the inundating force of the typhoid poison may overrun the brain and spinal cord, and the weakest parts of these will succumb. Sometimes the intellectual centres will be most affected, at other times the stress will be felt most by the motor, the sensory, or heat-regulating portions of the cerebro-spinal system; while in patients with different predispositions the force of the attack may expend itself on the gastro-intestinal, hepatic, respiratory, renal, or integumentary systems, thus giving rise to the varying trains of symptoms which characterize the divergent forms of enteric fever.

A STUDY OF THE ANÆSTHESIAS OF HYSTERIA.¹

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THE object of my paper is to report the results of a study of the anæsthesias of hysteria. This is a subject upon which a good deal has been

¹ Read before the Association of American Physicians, May, 1899.

written; but, as those familiar with hysteria will admit, there still remain many questions to be settled, and their importance, I think, need not be urged. Objective symptoms are always very greatly desired in medico-legal cases, as well for guidance in diagnosis and treatment, and anæsthesia in some of its forms has the value of an objective symptom. The anæsthesias found in hysteria may, it is true, be sometimes caused by organic disease; but this is not the case often, nor can organic disease ever present the same association of symptoms as those found in the profoundly marked cases of hysteria.

I shall not go into any extended history of the study of hysterical anæsthesia. The credit of initiating and carrying out investigations of the special-sense disorders belongs to Charcot, Galezowski, Landolt, Badal and Binet, Pichon, and Charcot's pupils, Turette, Guinon, and others. Special articles have appeared in Germany by Oppenheim, Thomsen, Moravcsik, Babinsky, and Schiele. Among English writers, Thorburn, H. Griffith, Beever, Bastian, and Buzzard, and in this country, Putnam, Walton, W. O. Moore, Mitchell and de Schweinitz have made important contributions.

My studies were made upon thirteen cases of hysteria, in men and women, of traumatic and non-traumatic origin. Most of them were cases under the observation for a long time of myself and other neurologists, and in all there was perfect agreement as to diagnosis, a diagnosis justified in several cases by the subsequent complete recovery of the patients.

The histories of my cases illustrate very well the four points in regard to hysteria which modern researches have tended to bring out. These are: 1. The comparative frequency of the disease in men. 2. The common characteristics of the disease, whether caused by shock, trauma, local irritations, or general depressing influences. 3. The presence of some of the objective symptoms or stigmata of the disease in all cases. 4. The combination of true hysteria with organic disease.

As I have stated, the class of symptoms which I particularly investigated was the anæsthesias. The hyperæsthesias, pains, paralyses, tremors, spasms, crises, etc., are referred to incidentally, and not in detail. Nor have I time or space to give full reports of each case. I shall only present enough to justify my diagnosis.

The points especially noted were the cutaneous sensations of touch, temperature, and pain, their disorders and the distribution of them, the muscular and articular sensations, the vision, hearing, taste, smell, and the reflexes.

The cutaneous, the muscular, and the articular sensations were examined in the usual way. The deep sensibility was tested by thrusting needles into the periosteum and joints. The vision was tested for acuity, visual field, and color-sense. The visual fields were tested with Emerson's perimeter. The fundus was examined by myself or others. Hearing

was tested for acuity both by aerial and bone-conduction. It was also tested for high notes by means of Galton's whistle, and for low notes by means of a bass-viol string which gave a note of sixty to seventy vibrations per second.

It will be seen that the persons whose histories I relate are not sufferers from the grand hysteria of La Salpêtrière, with cycles of convulsive seizures. The patients were generally quiet, much depressed mentally, discouraged by suffering, lacking vitality, hopefulness, and volitional power. They were made ill by depressing influences, hard work, and poor food, or by injuries or profound mental shocks. Seven were men, and they were among the most typical cases. Nearly all were of foreign birth, or immediate descent, and generally of German, Polish, or Russian origin.

CASE I. *Hysteria with anæsthesia*.—Woman, aged twenty-four years, cloak-maker, Hungarian. Childbirth, puerperal fever, abdominal and ovarian neuralgia, oöphorectomy. Symptoms date back three years to birth of a child and fever. Mental depression, apathy, general weakness, neuralgias, no paralysis.

Sensory symptoms: Has analgesia and tactile anæsthesia in patches over limbs. No thermo-anæsthesia or ataxia. Ears: Vision good, visual field limited in both eyes, color-sense not tested. Hearing normal. Taste normal. Smell normal. Discharged unimproved, and is now in about the same condition.

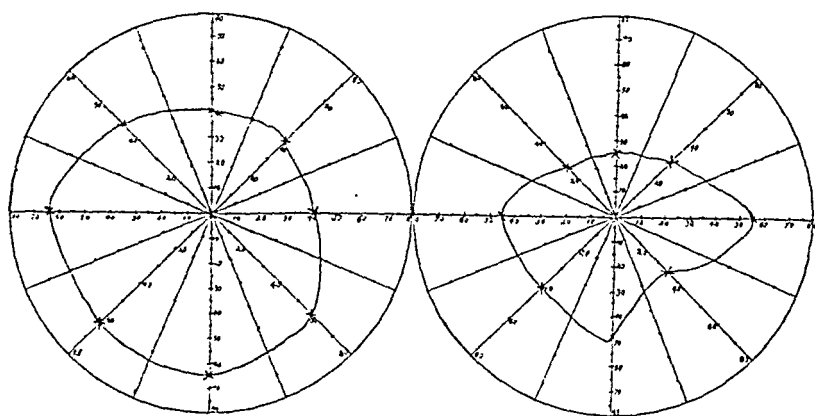
CASE II. *Hysterical hemianæsthesia*.—Moses S., aged fifty years, married, tailor, German. Family history negative. Personal history: has been in good health until seven years ago, then had headaches and nasal trouble. Three years ago had attacks of transitory neuralgia of infra-maxillary branch of trigeminus with aphasia. Then had and still has occasional diplopia, impairing vision. Attacks of a syncopal character lastly developed, and obliged him to give up work and enter the Montefiore Home, June 2, 1889.

Status præsens: A small man, prematurely old, quiet manner. Slight weakness of right arm and leg; no facial or ocular paralyses. *Sensation*—Cutaneous: Tactile and pain anæsthesia on right side. Temperature-sense preserved on examination in June. Later (September) it disappeared. No loss of muscular or articular sensation; no ataxia. Mucous membrane of mouth hemianæsthetic; pharyngeal reflex not abolished on either side. Eye: Concentric limitation of visual field, more in right eye; no disturbance of color-sense. Fundus showed no special change; has a presbyopic eye. Ear: Some diminution of acuity of hearing in right ear, especially to bone-conduction. Limitation of hearing to high and low notes in right ear. Taste, hemiagesia. Smell, hemianosmic. Knee-jerk lessened, especially upon the right side.

During the subsequent seven months the patient had attacks of the nature of spontaneous hypnotism. In one attack the Home physician, Dr. Ettinger, was suddenly called to patient, who was declared by the nurse to be dying. Pulse slow, strong, and full; temperature and color normal; pupils normal; pupillary reflexes preserved. State pronounced to be the hypnotic. Aroused by blowing into his face and irritating the

conjunctiva with the pulp of one finger. A few passes made over the eyes sufficed to cause the patient's return to his former condition.

CHART I.



$$\text{O. S. V.} = \frac{20}{200} : \text{with } + \frac{1}{36} = \frac{20}{40}.$$

$$\text{O. D. V.} = \frac{20}{200} : \text{with } + \frac{1}{36} = \frac{20}{40}.$$

Color perception perfect. Dacryocystitis.

April, 1890: Patient still exhibits his hemi-paresis and anæsthesia, but is better of his hypnotic and neuralgic troubles, and is stronger.

CASE III. *Hysterical anæsthesia and vomiting*.—Israel S., aged thirty-seven years, married, tailor, German. Family history negative. Personal history: No illness until three years ago, when he began to suffer from headaches, left-sided pains, and attacks of vomiting.

Entered the Montefiore Home June 12, 1887. From that time to September, 1889, he presented about the same symptoms. He vomited food daily, generally ten to fifteen minutes after taking it, and without nausea. Despite continual vomiting he lost no flesh. Has no crises except of vomiting and pains in head; mental condition depressed. Forced feeding, medicinal treatment, lavage, did little good. Weight continued 108 to 110 pounds.

Sensation.—Cutaneous: Complete bilateral analgesia, except in first branch of trigeminus, where it is less marked. Thermal sense not noted. Tactile anæsthesia over same area less complete. No muscular and no articular anæsthesia. No ataxia. Eyes: Vision normal; concentric limitation of visual field of both eyes. Reflexes: Exaggerated knee-jerk. At one time he had retention of urine.

CASE IV. *Hysterical paraplegia*.—Mrs. Mary D., aged twenty-eight years, widow, seamstress, Hungary. Family history negative. Personal history: Well up to five years ago; first child at twenty years, normal labor; second pregnancy at twenty-third year, during it lost her husband suddenly; labor at term was difficult, and was followed by much menorrhagia. Since that time has had three operations on the womb for lacerations, etc. February, 1889, double oöphorectomy was performed. Since then she has been unable to walk; has attacks of

crying with sensation of complete powerlessness; has less pain than before operation. After admission she had hysterical convulsions which could be controlled by ovarian pressure.

Status præsens: A dark, sallow, anæmic-looking woman; muscles well developed; has incomplete paraplegia, and walks with great difficulty. *Sensation*—Cutaneous: Analgesia over right hand, and in patches over arm, less in left arm. A zone of anæsthesia over abdomen between umbilicus and Poupart's ligament. Loss of tactile sense is slight. No thermal or muscular anæsthesia. Ear: Limitation of auditory field in left ear to high notes. Bone-conduction and low notes not tested. Eye: Visual acuity normal; concentric limitation of visual fields of both eyes. Taste normal. Smell normal. Patient improved under hydrotherapy, pack and half-bath daily, and faradic brush. She was discharged, cured in November, 1889.

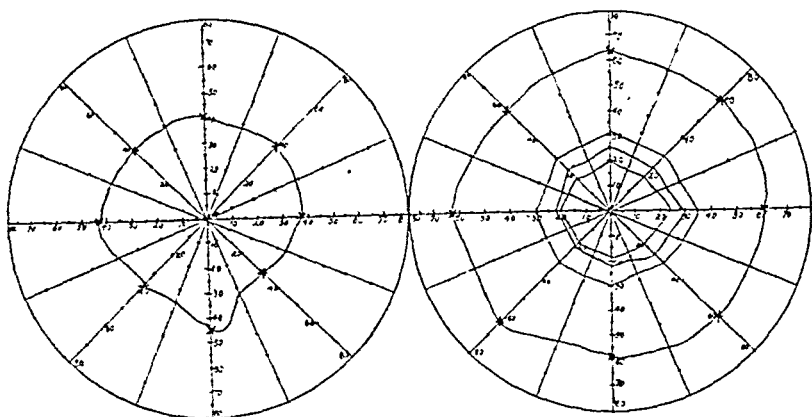
CASE V. *Hemianæsthesia, brachial monoplegia*.—Sarah C., aged twenty years, domestic, Galicia. Family history negative. Personal history: Good health until two years ago, then began to have attacks of vertigo, headache; would fall to the ground, sometimes with loss of consciousness. After some months she began to lose power in the left arm. A year ago entered Bellevue Hospital; here her seizures ceased under moral treatment, but after two months her monoplegia suddenly became complete.

Status præsens: Looks old for her age, muscular and adipose tissue well developed. Height five feet three inches; no disturbance of facial or ocular muscles. Pupils react normally. Complete flaccid paralysis of left arm; she cannot move arm, forearm, or fingers; no atrophy at all, as shown by measurements. Electrical reactions show slight quantitative diminution of sensibility and contractility of both currents. *Sensation*—Cutaneous: She has cutaneous hemianæsthesia of the left side as far down as the knee. At one time it had included the whole of the left side. There is loss of tactile-, pain-, and temperature sense. Muscular and articular sense still somewhat retained; she knows the position and movements of her arms, but not of her fingers. Eyes: Concentric limitation of visual field of right eye. Amblyopia of left eye. She can see light, and, to a certain extent, form, but cannot recognize colors or distinguish the nature of objects. No disturbance of color-sense in right eye. Mucous membrane of mouth anæsthetic. Pharyngeal reflex absent on anæsthetic side only. Ears: Some deafness in left ear; watch heard at three inches from left ear, at ten inches from right ear. Slight bone-deafness. Marked deafness to high notes, as tested by Galton's whistle, and to low notes, tested by bass-viol string. Smell, left hemianosmia. Taste, hemiageusia. Tendon-reflexes lessened on affected side; organic reflexes normal. Patient is depressed mentally, but is very anxious to get well, and has no crises. Has been hypnotized several times with no benefit; is improving under hydrotherapy and electricity and strychnine hypodermically.

May 12. There is considerable return of motor power in the left arm: at first there was much tremor, but it is subsiding with the increase of strength. *Cutaneous sensations*—arm and face: Tactile sense is slightly diminished, especially for localizing, but very light contact is felt without delay. Pain-sense is still nearly abolished. Temperature-sense is entirely absent to both heat and cold. Pain is felt, however, in the periosteum when the bone is struck by a needle. Weight-sense is im-

paired, but articular sensations, as tested by posing and coördinating the limbs, are perfect. There is no ataxia. Vision: There is some dimness of vision in the right eye, but no loss of color-sense. In the left eye there is loss of color-sense, and almost complete loss of vision. She recognizes a light, and imperfectly a form, but cannot tell how many fingers are held up. With colored glass over this eye she has monocular diplopia on repeated tests. With colored glass over both eyes she has diplopia. With colored glass over both eyes she also insists that the image of the left eye is smaller—*i. e.*, micropsia. The visual field is contracted most in the left eye, where there is also loss of color-sense. In the right eye there was a little change in the arrangement of the colors, but no inversion of formula, except that it was green, red, violet, instead of violet, green, red. Hearing to the watch in right ear at ten inches,

CHART II.



$$\text{O. S. V.} = \frac{5}{200} : \text{with } -\frac{1}{20} = \frac{20}{40} +. \text{ Periopic choroiditis atrophica.}$$

$$\text{O. D. V.} = \frac{6}{200} : \text{with } -\frac{1}{20} = \frac{20}{40} +.$$

Color-sense absent in left eye. Field limited, with some changes in right eye, as shown by chart. The order of colors from within out was green, red, blue, violet, yellow.

left ear three inches. Deafness to tuning-fork in left ear when vibrating on the teeth or the mastoid. Deafness in left ear to high note and low notes.

CASE VI. *Hysterical paraplegia*.—Fanny H., aged fifty-two years, widow, seamstress, Prussia. Family not neurotic. Personal history: Three convulsive seizures at the beginning of menstruation; menorrhagia and various minor uterine troubles during her life; married twice, had one child and one miscarriage; was anemic and overworked for some years prior to present trouble; always constipated, and had some rectal trouble from operation, to which she ascribes her present illness. This began in December, 1888, with severe lumbar and pelvic neuralgias. Tremor in arms developed rapidly, and, at the same time, weakness in the lower limbs.

Status præsens, September, 1889, nearly a year after the disease began: She has paraparesis more in right leg, and walks with difficulty. Right arm weaker than left. A fine tremor increased on voluntary movement, most marked in right arm but somewhat in left. Ocular muscles normal; no facial paralysis. *Sensation*—Cutaneous: Patches of analgesia over feet and ankles. No tactile or thermic anæsthesia or ataxia. Knee-jerk somewhat exaggerated. Eyes: Vision good, slight temporal limitation of visual field in both eyes (65° in each). Ears: Hearing good. No bone-deafness or limitation of aural field. Taste normal. Smell normal. This patient improved steadily under treatment, and was discharged cured. The symptoms suggest multiple sclerosis, but the course of the disease disproves it. She was markedly neurotic and emotional, but had no crises.

CASE VII. *Hysterical paraplegia*.—Augusta K., aged forty years, widow, buttonhole-maker, German. Personal history: Since age of thirty-four has had occasional attacks of rheumatism. Has had nine children. No nervous disorder. Lost the use of the right arm for two months, and began to develop paraplegia and various forms of neuralgia, especially spinal.

Status præsens, two years later: Patient is in good health, but flabby and anæmic. Mentally depressed and melancholic. Paralysis so that she cannot walk except with support. No spasms or tremor. Muscles not atrophied except from disuse. *Sensation*—Cutaneous: Bilateral analgesia and tactile anæsthesia over four extremities, but not face; no thermo-anæsthesia or ataxia. Eyes: Vision good. Pharyngeal reflex normal. This patient continued for nearly two years paraplegic and suffering from neuralgias and headaches, occasionally vomiting and dysuria. She is now very much improved, and her anæsthesias have disappeared.

CASE VIII. *Hysterical incontinence and vomiting, hemianæsthesia*.—Fanny G., aged twenty years, single, seamstress, Russia. Family history negative. Personal history: Had no special illness until her fifteenth year. Then after exposure had dysuria and bloody urine. Suffered from this at intervals ever since. Came to the United States one and one-half years ago, and for two months was well; then suddenly developed cystitis and retention. Has had two vaginal operations and a suprapubic cystotomy done for relief of vesical pain, spasm, and cystitis, but with no success.

Status præsens, September, 1889: Patient is of small stature, somewhat thin. She remains in bed most of the time, and cries frequently on account of her pains. She is depressed and emotional, and tends, it is believed, to exaggerate greatly her sufferings. No paralyzes or spasmodic symptoms. She has hysterical crisis of an emotional character. *Sensation*—Cutaneous: She has analgesia in patches over the extremities, more on the left side; no tactile or thermo-anæsthesia or ataxia. Eyes: Vision good; field much limited concentrically in both eyes and decidedly. Other special senses normal.

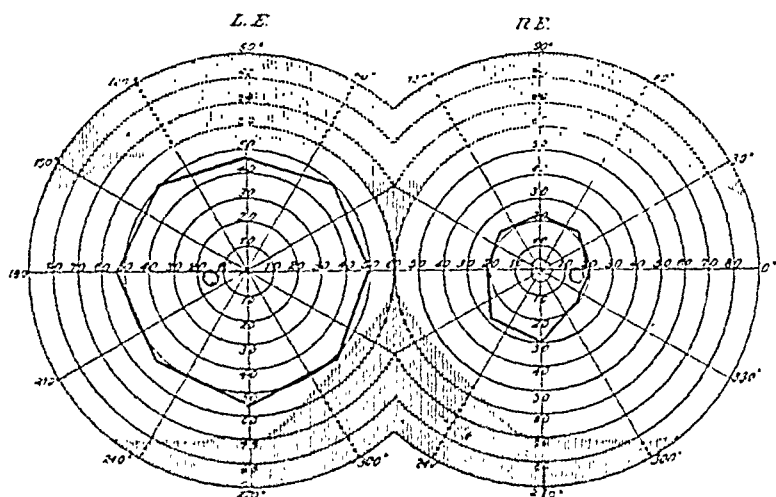
March, 1890, six months later: The patient's bladder ceases to trouble her, and she now has obstinate vomiting. *Sensation*—Cutaneous: She has left hemianæsthesia to touch and pain, very slightly to temperature; pharyngeal reflex absent on affected side. Eyes: Vision good, field limited, no disorder of color-sense. Smell normal. Taste normal. Hearing: Hyperæsthesia; no limitation of field to high notes.

CASE IX. *Hemiplegia from injury; hysterical anæsthesia*.—M. L., aged forty-seven years, married, German. Five years ago injured in right side of neck by an iron rod, causing, it is alleged, a perforating wound. Injury followed by right hemiplegia and right facial paralysis. Operated on by Dr. Robert Abbe for left tic douloureux with great temporary relief, the second branch of the fifth nerve being removed.

Status præsens, April, 1890: Patient is a well-nourished, healthy-looking man, complaining only of neuralgia in the left inferior maxillary nerve. He has paresis and some rigidity of the right arm. Dynamometer: right hand, 30; left, 45. He has apparent paresis of left leg, but tested on pedometer he pushed 140 pounds with the left leg and 100 pounds with the right leg. No facial or ocular paralysis. Tendon-reflexes exaggerated on parietic side. *Sensation*—Cutaneous: Anæsthesia of left side of face and right side of body and extremities. Left face: Loss of tactile and pain sense. Right arm and hand: Diminution of tactile and pain sense; retention of cold-sense and weight- and muscle-sense. Eyes: Vision good, but is color-blind. Concentric limitation of visual field in both eyes; fundus normal. Taste: Left hemiageusia. Smell: Left hemianosmia.

CASE X. *Traumatic hysteria, hemiplegia, and hemianæsthesia*.—Adolph N., aged fifty years, married, clerk, Moravia. Family history negative. Personal history: A man of nervous temperament but good habits, and no previous nervous disorder. Was struck on the head by a dead electric-

CHART III.



$V = \frac{15}{60}$. Inner circle shows limitation of visual field for colors.

light wire, knocked down, taken in a semi-unconscious state to a hospital, where he was found to have right hemiplegia, except of face, eyes, and tongue, right-sided intention-tremor, right hemianæsthesia, mental depression; no crises, knee-jerk lessened. *Sensation*—Cutaneous: Right side anæsthesia most marked in extremities, well marked for pain and

cold, less marked for tactile sense; no muscular or articular anæsthesia. Eyes: Decided limitation of visual field, especially in right eye. No loss of color-sense. Fundus normal. Hearing: Good to voice and watch in both ears, but complete bone-deafness in right ear, and deafness to high notes and to low notes. Smell: Left hemianosmia almost complete. Taste: Left hemiageusia. Pharyngeal reflex absent.

CASE XI. *Hysterical paraplegia*.—Mrs. K., aged thirty-two years, married, United States. Neurotic family. Had incontinence of urine and migraine as a girl. Married at nineteen; child born at twenty; after this, better for several years. At the age of twenty-eight, pains in back and legs very severe, with weakness of lower limbs. Was treated gynecologically for a long time. Now has paraparesis and pains in legs; no bladder trouble, atrophy or anæsthesia; knee-jerk normal. Has insomnia, nervous crises, limitation of visual fields, but no color-change or auditory or other special-sense troubles.

CASE XII. *Hysterical paraplegia, traumatic*.—William B., aged twenty-six years, single, United States. Injured by fall in August, 1885. In St. Luke's Hospital from October, 1885, to May, 1886, and had convulsive attacks there. Right hemiparesis, especially of leg; walks with difficulty. No atrophy; but exaggerated knee-jerk and ankle-clonus. Slight analgesia, right leg and lower half of thigh, and right forearm and hands. Thermo-anæsthesia over same area; contact-sense good. No muscular anæsthesia. Concentric limitation of visual field; scotoma for red (due to tobacco?). Fundus shows a tobacco-atrophy.¹ Auditory field normal. No ageusia or anosmia.

CASE XIII. *Traumatic hysteria, right hemiplegia, and hemi-anæsthesia*.—August J., aged thirty years, mechanic, German. Personal history: Patient has had good health, good habits, no nervous disease. Injured slightly by electric wire in August, 1889; received no electric shock, but was extremely frightened. Next day headache, vertigo, mental confusion, insomnia, weakness in right arm and leg, with tremor. These increased.

Status præsens, October, 1889: Patient is a stout, florid-looking man; has some weakness in right arm and leg; no facial or ocular paralysis. *Sensation*.—Cutaneous: Patches of incomplete tactile and pain-anæsthesia on right forearm and fingers; right leg and foot showed also a slight degree of all forms of anæsthesia. No muscular or joint anæsthesia. Knee-jerks exaggerated, especially on right side; no clonus. Eyes: Vision good; insufficiency of external recti muscles abd. 4. add. 18-20. Visual field limited in right eye, not in left; no amblyopia, color-sense normal. Ears: Slight deafness to watch in right ear, not in left; deafness to high notes in right ear. Smell normal. Taste normal.

A study of the symptoms observed in the foregoing cases shows us that the most constant form of sensory anæsthesia is a limitation of the visual field.

Next in order come disorders of the cutaneous sensations; and of these the pain-sense is oftenest affected, then the temperature, and last the tactile sense.

¹ The examination was made for me by Dr. W. H. Bates.

The muscular and articular sensibility is rarely involved, and hysterical ataxia is rare.

The color-sense is sometimes implicated, but the complete inversion of the formula was not seen; color-blindness occurred in two cases.

The peripheral field very easily tires for color, so that a patient who at first could recognize a color in the outer limit of the perimeter, after a short time ceases to do so.

Limitation of the auditory field for high notes is common, and is usually associated with bone-deafness to some extent. Deafness to low notes is quite rare, but occurred in three cases. The auditory disturbances are much oftener observed in connection with hemianæsthesias.

The pharyngeal reflex is usually absent on the anæsthetic side in hemianæsthetic cases, but it was not absent on the sound side, nor was it absent with the less extensive bilateral anæsthesia of the skin.

The knee-jerk in hysterical hemiplegia was diminished or even temporarily absent. In paraplegia it varied.

Taste and smell were not lost except in the hemianæsthetic cases.

The frequency of the anæsthetic symptoms may be summarized thus:

1. Limitation of visual field.
2. Cutaneous anæsthesia—
 - (a) Pain.
 - (b) Temperature.
 - (c) Tactile.
3. Auditory disturbances: bone-deafness and limitations of field.
4. Dyschromatopsia.
5. Muscular and articular anæsthesia.

I will add a few words now regarding some of the special forms of anæsthesia.

The Cutaneous and Muscular Sensations.—The cutaneous anæsthesias are distributed quite often in zones or patches upon the extremities, and in the glove or stocking-like distribution. But they are also often unilateral.

The anæsthesia is more marked the more widely it is distributed, or the more rigidly it is confined to one side. Like hemiplegia, it may be deepest on the arm, and leave the leg and face before leaving the upper extremities. The profoundest types are nearly always associated with some paralysis and tremor, and when the muscular sensibility is involved the paralysis is still more surely present.

These facts all seem to point to a common cortical seat for motor and sensory functions.

The anæsthesia, if unilateral, may be transferred by hypnotic suggestion or cutaneous irritation. I was never able to do this in my cases, however; but I did succeed in removing the anæsthesia over certain

areas by the use of metal disks, and this furnishes a test of its functional character.

The greater frequency of the loss of pain-sense in hysteria is, I think, a fact which other experimenters will confirm.

The temperature-sense is more often disordered than actually lost.

The tactile sense is usually a little affected in most cases, but it often remains relatively good long after pain-sense has disappeared.

Hysterical ataxia does, I know, occur; but it seems to be relatively rare, and was absent in all my cases. Even in profound types of hemi-anæsthesia with hemiplegia, the position of the limb may be appreciated by the patient.

In general, it may be said that the hysterical monoplegias and hemiplegias carry with them the profounder sensory disturbances. In hysterical paraplegia often no anæsthetic disorder is discoverable. Such cases are, in fact, rather functional spinal disorders than cortical or "ideal" paralyses like the hemi- and mono-plegias.

Anæsthetic hysteria is usually associated also with much mental depression.

A word, finally, in regard to the methods and difficulties of the examinations. In making the tests for anæsthesia in hysterical persons the greatest care has to be taken. Patients are often refractory, or soon get tired and become perverse and untrustworthy.

The examination of the skin and deeper sensations does not present so much difficulty. The eye-test, however, requires extra care. It must be remembered that an apparent limitation of the visual field may be due to stupidity or perverseness, or it may be due to refractive errors, to optic atrophy, or other organic eye-disease. Ziem has asserted that it occurs in diseases of the nose and antrum (*Berl. klin. Wochenschr.*, xxv. p. 37, 1888; *Deutsche med. Wochenschr.*, xv. p. 5, 1889); Moravcsik (*Neurol. Centralbl.*, 1890, p. 230) shows that the visual field may, in hypnotized persons, be enlarged through the influence of cutaneous, auditory, or odorous sensations, and that it may be contracted by depressing, and enlarged by pleasurable emotions.

A point in visual examinations of the field, also of importance, is the intensity of the light. Persons with a contracted field for a white disk have a large field for a bright light; and by using bright-colored lights very different perimetric charts will be obtained.

The symptom of contraction of the visual field, therefore, is one whose significance must be closely weighed.

I have made this examination in a large number of neurasthenic persons, and a few epileptics, and in a case of paralysis agitans and Basedow's disease; I did not find any limitation, and the investigations of others also tend to show that it is not found in the neurasthenias or the great neuroses other than hysteria.

There have not been many studies yet of the limitation of the auditory field, particularly for low notes. In testing here it must be remembered that some people are born deaf for high notes, and that in ordinary partial deafness the hearing of high notes may be most impaired.

The test of hearing for low notes has been often made by me, and deafness rarely discovered, but it certainly is present sometimes. Bone-deafness usually accompanies the limited auditory field.

In conclusion, I have hoped to bring out some further facts which will give more certainty to our knowledge of the stigmata of hysteria, and enable us to speak with greater confidence of its existence.

The characteristics of hysterical anæsthesia are:

1. Its frequent presence in the retinal field, and its peculiar distribution here.
2. Its distribution on the skin, affecting first the pain-nerves, and its modification, disappearance, or transfer by metals, or suggestion, or cutaneous irritants.
3. Its peculiar involvement of the auditory nerve, causing deafness to high and even low notes, as well as its dulling the hearing generally.
4. The rarity of muscular and articular anæsthesia, except in connection with profound paralysis.
5. The involvement of the taste and smell.

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SOME CONSIDERATIONS IN REGARD TO ACUTE OBSTRUCTIVE DISEASES OF THE LUNGS.¹

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WHENEVER there is obstruction of the pulmonary circulation, the labor of the right heart is necessarily increased. In proportion to its inability to overcome the obstruction there will be an accumulation of blood in the venous system. Excess of blood in the veins implies deficiency in the arteries, and hence this class of affections is characterized by an unequal division of the blood between the venous circulation and the arterial.

This condition has extremely important consequences, especially in acute pulmonary affections. In these we study the pulse with the greatest solicitude to judge how the heart, as we say, is supporting the struggle. But the arterial pulse gives no indication of the immediate peril, for it is not the left heart that is bearing the brunt of the battle. The pulse tells its story only at second-hand. It may be small and weak, but it is chiefly because the left heart does not receive enough blood from the lungs to fill its chambers and to distend the arteries.

The trouble is not in lack of propelling power so much as in deficiency of blood to be propelled.

But if, instead of feeling the radial pulse, we could lay our finger upon the pulmonary artery, we should obtain information vastly more to the point. We should then be able to appreciate the degree of pulmonary obstruction by the fulness of the vessel, and to rate the power of the right ventricle by the force of the arterial beat. And in the relation of these two factors one to the other is involved the issue of the case. Increasing obstruction with decreasing right-heart power means death; decreasing obstruction with sustained right-heart power gives promise of recovery. It is a question with which the left heart, and therefore the radial pulse, has almost nothing to do. For the peril is not from general exhaustion, as for example in fever, nor from failure of the heart as a whole, as in some cases of infection, but specifically from tiring out of the *right* heart in its effort to unload the venous circulation through the obstructed vessels of the lungs.

Now, while we cannot place our finger upon the pulmonary artery,

¹ Read before the Section on Internal Medicine, of the Tenth International Medical Congress, August 6, 1890.

we can obtain nearly the same information by applying the stethoscope over the pulmonary valve. Owing to anatomical conditions which it is not necessary to describe, it is entirely practicable to separate the pulmonary-valve sounds from the aortic, and by means of auscultation to study the peculiarities of the former as indicating the condition of the pulmonary circulation.

Unfortunately, however, in some cases the valve-sounds are masked by bronchial râles, so that it may be impossible to appreciate them accurately. But even in the most rapid breathing there are brief intervals during which the practised ear may nearly always gather the required information.

Now if we note carefully the sound of the pulmonary valve in, for example, a case of pneumonia, we shall find that at the outset, while the right ventricle is still in vigorous action, this sound is especially clear and sharp, indicating a quick and strong recoil of the pulmonary artery following the ventricular systole. This sharp recoil is due to unusual distention of the vessel, and this in turn is due to the resistance which the blood meets in passing through the lungs.

If the case is to terminate favorably this accentuation of the pulmonary sound will probably continue through the whole course of the disease, becoming less marked as the obstruction in the lung decreases. But in cases of increasing severity, and with an unfavorable tendency, a time soon comes when not only this accentuation is lost, but the normal intensity of the valve-sound is lessened, the sound becoming weaker and weaker, until it ceases to be heard. This means, not that the obstruction has become less, but simply that the muscular power of the right ventricle has become exhausted with the labor exacted of it. The blood is no longer driven into the artery with sufficient force to distend it, and there is not enough recoil to bring the valve-cusps together with an audible sound.

When this point is reached, the end is not far off. The weakened right heart favors still greater pulmonary obstruction, and this in turn adds to the burden of the right ventricle, thus completing the vicious circle. The struggles of the ventricle become feebler and feebler, while the tension within its cavity constantly increases, as the blood presses into it from behind. At last there comes a moment when the overtaxed muscle cannot summon the energy for another contraction, and its action ceases in diastole.

The steps which lead up to this result are in a great degree traceable by symptoms and physical signs. First of all, there are auscultatory and other signs of pulmonary obstruction; then come signs of general venous congestion. The distended right auricle may be traceable by percussion, or even may be seen pulsating at the right of the sternum. An increased area of cardiac dulness extending toward the xiphoid

cartilage indicates the repletion of the right ventricle, and in spare subjects the labored beating of this may be felt by pressing the fingers under the costal cartilages. The tense, hard pulse of inflammation is replaced by the small creeping pulse of arterial depletion. The superficial veins are seen to be unusually prominent, and the liver is enlarged. The spleen also is increased in size, and evidence of intestinal congestion may be afforded by copious diarrhœa.

Proof or passive hyperæmia of the kidneys is found in lessened excretion and albuminuria. Thus all things combine to indicate a general preponderance of blood in the venous side of the circulation, the result which we should naturally expect from a retardation of the blood in the pulmonary vessels.

Now, what is the indication for treatment to be derived from this accumulation of blood in the venous system? Manifestly it is to diminish in every safe and proper way the disparity between the venous and the arterial supply. Formerly this was attempted by copious bleedings, which, however, were practised rather as a general antiphlogistic measure than with any exact notion of the mechanical conditions present. Certain it is, that the practice often resulted in at least temporary relief, which was ascribed to subduing the inflammation. Withdrawing a large amount of blood from the venous system would naturally bring relief to the congested lungs, and give a brief respite to the overworked right ventricle. In a certain proportion of cases this would be enough to bridge over a critical period, and I do not doubt that many cases were saved in those days by the lancet. Nor do I doubt that the entire abandonment of venesection at the present day is an excessive reaction from the sanguinary treatment of those diseases which were common in the early part of this century.

But in the majority of cases the beneficial effects of venesection can be obtained by other and less objectionable means.

Instead of diminishing the whole mass of blood we can bring about a more even distribution of it between the venous and arterial systems, and thus relieve in a measure the engorgement of the former.

As preliminary, however, to the consideration of more direct means to this end, I would call attention to the importance of regulating the quantity and the quality of the diet in reference to the changed conditions of congestion and hæmatosis.

The anxiety "to keep up the strength" and the apprehension excited by the small and feeble radial pulse are apt to suggest the administration of more food than is beneficial or necessary. We forget that the digestive organs are not in a condition to do the work demanded of them in health, and also that the pulmonary obstruction interferes with the process of hæmatosis. Giving an excess of food therefore entails a double embarrassment. There is the burden arising from undigested

food in the stomach, giving rise to flatulent distention, and thus rendering respiration more difficult; and there is also the risk of loading the blood with more nutritive material than the imperfect respiration can act upon in the process of sanguification. In regard to this latter point, I think it more important than it generally appears to have been regarded. We are too apt to consider only how much food can be digested and absorbed, and to overlook the fact that before the food so absorbed can really contribute to the sustenance of the body or add to the strength of the patient, it must undergo a process of assimilation, a process in which respiration plays an important part. The introduction into the venous current of more nutritive material than can be fully acted upon through the agency of the respiration, not only fails to add to nutrition, but is a positive burden to the already overtaxed vital powers. Such excess must be thrown out of the system, and vital energy must be expended in getting rid of it; and meantime it is everywhere a hindrance to the vital functions.

Now it is precisely those alimentary substances which we would select on account of the ease with which they are digested and absorbed which for the same reason are most likely to be taken into the circulation in harmful excess. In this view it might even be better for the patient, if he must be overfed, that his food should be of a less digestible character, as the excess would do less harm in the alimentary canal than in the bloodvessels. We are apt to give freely of albuminous substances, and too often the instinctive craving for simple water to dilute the blood and facilitate its passage through the lungs is met by the constant proffer of milk, beef-tea, etc., in which the water is spoiled for nature's purpose by the addition of unnecessary food.

If then we find albumin in the urine we refer it to the congestion of the kidneys, instead of regarding it as an indication that the blood is surcharged with the products of digestion.

In view of these facts it becomes necessary to observe closely the effects of the nourishment given, and to assure ourselves, not only that the food is properly digested, but that it does not increase the embarrassment under which all the functions of the body, and especially the respiration, are laboring.

I am strongly of the opinion that if we study our cases closely with this in view we shall find more justification than we were prepared to admit for the very restricted diet which formerly was so much in vogue in the management of acute diseases of the respiratory organs. The danger here, let me repeat, is not from general exhaustion. It takes time to bring this about, as we see demonstrated even under the exhausting conditions of typhoid fever. But in the case before us the vital machine, as a whole, is *clogged*; it is only the right heart that is *exhausted*, and this not because it is underfed, but because it is overworked. Let

us be watchful then, that the nutriment we force upon the patient does not add at once to the clogging and the overwork.

But there is one form of food which is less liable than most others to defective assimilation, and this is alcohol. I say food advisedly, for, notwithstanding all that has been said to the contrary, I believe that in reasonable quantity it acts as such.

Alcohol is easily taken into the circulation, is easily oxidized, and any excess is readily disposed of by the emunctories, instead of remaining to embarrass the vital processes. Moreover, it retards tissue-change, and thus lessens the amount of carbon dioxide which the lungs are required to dispose of. The use of alcohol as a food in these cases is justified, therefore, as fully by its physiological action as by its chemical effects. But aside from its nutritive value, its stimulating action is of the greatest importance. Nothing else meets the indications so fully when depression of the nervous system is pronounced. Especially in pneumonia, when under the shock of the infection we find the patient delirious, with tremor and all the evidence of nervous exhaustion, the liberal use of alcohol is emphatically called for. But there is still another action of alcohol which, in my judgment, adds greatly to its value; I refer to its power to relax the arterial system. And this brings us to the consideration of the class of medicines which are distinguished by this property. Chief among these are the nitrites, but the property is shared in a less degree by numerous other remedies and notably by aconite, the value of which in inflammatory diseases accompanied by high arterial tension is now universally admitted. It was in connection with this drug that the idea of "bleeding a patient into his own vessels" was first suggested, and the phrase well expresses the peculiar action of this class of medicines. By their specific effect either upon the vaso-motor nerves or directly upon the muscular fibre of the vessels, they cause a relaxation of the muscular coat and a consequent dilatation of the whole arterial system. The change in capacity which may be effected in this manner is much greater than is generally believed. On this point Ringer says, "It has been shown that the vascular system is always in a state of semi-contraction, and that by paralyzing the vaso-motor nerves it is possible to double its capacity." An effect much short of this would be sufficient to produce a vast difference in the dynamics of the circulation, and to afford a large measure of relief to the over-distended venous system.

It is in this way, I contend, that we should direct our efforts in cases involving pulmonary obstruction. I am aware that there is an opinion prevalent that these drugs are contra-indicated when there is feebleness of the heart's action; and there are many practitioners who would regard, with a feeling akin to horror, the administration of nitroglycerin, for example, when the pulse is notably small and frequent.

If the condition broadly but vaguely described as heart-failure were thought to be impending, the administration of such a drug would be looked upon by them as a sort of *coup de grâce*. And so it might prove to be, if the feebleness of the pulse were due simply to general adynamia. But the case is altogether different when it is a mechanical rather than a vital condition we have to deal with. By increasing the capacity of the arteries we relieve the veins by exactly the amount of this increase. Lessening the pressure in the veins lessens *pari passu* the pressure in the pulmonary circulation, and with it the tumefaction of the mucous membrane and the tendency to exudation into the air-passages. Relief to the respiration and lightening of the labor of the right heart are the immediate consequence.

Now this is one of the results of the administration of alcohol. Its action upon the pulse in these cases is to make it large and soft; in other words, to give it the character of a low-tension pulse, the so-called "brandy-pulse;" and in this increase of the arterial capacity lies, in my judgment, a large share of the value of this agent.

But we should not rest here. In urgent cases we should supply more powerful arterial relaxants, such as nitro-glycerin, and the potassium and sodium nitrites. Fraser has found nitro-glycerin extremely useful in relieving the dyspnoea in bronchitis, and he explains its action by assuming that there is in these cases a spasm of the bronchial tubes which is relieved by the drug. But the action on the vessels seems to me to afford a much more probable explanation. Again and again I have seen a patient with pneumonia, somnolent or even comatose, with the face gray, the lips livid, the respiration superficial and from 50 to 60 per minute, and the chest everywhere full of moist râles, but nevertheless rescued from this apparently hopeless condition by drop doses of a one per cent. solution of nitro-glycerin administered every fifteen or thirty minutes. Here the theory of spasm could scarcely be entertained, but the relief comes from the transference of a mass of blood from the veins into the arteries.

The sodium or potassium nitrite has the advantage of producing a more enduring effect than nitro-glycerin, and may be found preferable on that account.

Digitalis is often given in this condition, but it seems to me to be clearly contra-indicated by its tendency to diminish the vascular area. Its action is to empty the arteries into the veins, whereas our efforts should be to empty the veins into the arteries. Its administration proceeds upon the wrong assumption that the heart as a whole, and not the right heart alone, is in danger of exhaustion. Without giving any explanation of his observation, Loomis says that in pneumonia digitalis does more harm than good; and, barring exceptional conditions, I cordially agree with him. It cannot restore contractility to the paralyzed

vessels of the affected part; on the contrary, it serves only to distend them more by increasing the tension in the unaffected vessels with which they communicate. The energy it imparts to the heart is in proportion to the muscular tissue acted upon, and, therefore, is twice as great on the left side as on the right. But the left heart has already an undue advantage over its fellow, and only harm can come from further increasing the unequilibrium. Yet digitalis may do good in those cases of pneumonia marked by high temperature and great nervous exhaustion, and in which the condition is due to the intensity of the infection, and not to pulmonary obstruction. Here the heart as a whole is in danger of failing, and the tonic property of the digitalis may be of essential service.

Much benefit may be derived in some cases of pulmonary obstruction from the inhalation of oxygen gas. It is not only that the aëration of the blood is improved for the time being, but the pulmonary circulation is facilitated by this improvement. This is shown in pulmonary œdema, or, still more notably, in bronchitis, in the speedy decrease in the moist râles which often follows the inhalation of the gas. The influence of asphyxia in obstructing the pulmonary circulation is an elementary fact in pathology, and is exemplified in a less degree in the class of cases we are considering. Here again a vicious circle exists: congestion and effusion prevent proper aëration of the blood; imperfect aëration of the blood aggravates congestion and effusion. This circle is broken with the breaking of either of the segments of which it is composed. We strike at the congestion when we administer vaso-dilators; and at the imperfect aëration when we give inhalations of oxygen. A combination of the two methods will be successful in a considerable number of apparently desperate cases.

Finally, there are certain mechanical expedients to which we may resort before we abandon all hope of relieving the patient. One of these is artificial respiration. Just as the right heart becomes fagged by the unusual labor demanded of it, so the respiratory muscles become wearied out by the heavy task imposed upon them. But more serious than the muscular fatigue which interferes with inspiration is the sodden and inelastic condition of the lung, which hinders its retraction in expiration. The result of the combined conditions is an exceedingly superficial and, therefore, very frequent breathing, which rapidly exhausts the remaining strength.

Artificial respiration may do much, where this is the case, to supplement the efforts of the patient. It is best performed by two persons, one of whom draws the arms steadily upward over the head until the maximum of inspiration is obtained, when the traction being relaxed the other presses with both hands firmly upon the lower part of the

chest in a direction backward and toward the median line, thus diminishing both the depth and breadth of the thorax. This latter manœuvre will probably result in the expulsion of froth from the nose and mouth, which should be wiped away before the pressure on the chest is relaxed. By alternating these movements not only will a greater amount of air be taken into the lungs, but a considerable quantity of mucus, etc., will be removed. At the same time the assistance to the circulation which the respiratory movements naturally afford will be imitated, and the intra-thoracic vessels will be relieved of some of the blood with which they are distended.

In a certain proportion of cases the relief obtained by this aid to respiration will tide over a critical period.

Still another mechanical expedient may be resorted to in an emergency. This is placing ligatures about the limbs sufficiently tightly to interrupt the return of the venous blood. This, for the time being, is equivalent to a venesection, but the danger of inducing thrombosis must not be lost sight of. This may be lessened, if not avoided, by tying up and releasing the several limbs in succession.

RECAPITULATION.

1. In acute pulmonary obstruction, the danger being from exhaustion of the right heart, the pulse at the wrist does not give reliable indications as to the gravity of the condition.

2. This can be appreciated more correctly by studying the pulmonary circulation by the aid of the pulmonary-valve sound.

3. Marked accentuation of the pulmonary-valve sound indicates a fairly-vigorous right heart laboring to overcome resistance in the pulmonary circulation.

4. Decrease of a previously existing accentuation with only moderate dyspnoea indicates decrease of pulmonary obstruction.

5. Decrease of accentuation with increase of respiratory distress indicates that the right heart is becoming exhausted.

6. Relief is to be sought : *a*, by regulating the diet in conformity with the diminished power of digestion and sanguification ; *b*, by the use of medicines which dilate the arteries and promote transference of blood to them from the veins ; *c*, by the inhalation of oxygen gas ; *d*, by artificial respiration ; *e*, by placing ligatures about the extremities in order to retain the blood in them and prevent its return to the heart.

REVIEWS.

CONTRIBUTION A L'ÉTUDE DE LA SYRINGOMYÉLIE, PAR LE DOCTEUR
I. BRUHL. Paris: 1890.

A CONTRIBUTION TO THE STUDY OF SYRINGOMYELIA. By I. BRUHL, M.D.

THE word *syringomyelia*, we are told by Dr. Bruhl, was coined by Ollivier, who used it for the first time in 1837, in his treatise on the spinal cord. He applied the term, in a general way, to any canal or cavity in the interior of the cord, because he considered the presence of a central canal in the cord as always pathological. But Stilling, in 1859, corrected this erroneous view. He maintained that the central canal has a constant existence, an opinion which is now known to be right. The central canal of the cord being admitted, the word *syringomyelia*, in the sense of Ollivier, had no longer a *raison d'être*, and the word fell into disuse. It was replaced by the word *hydromyelia*, but the knowledge of the true pathological processes causing cavities in the cord was yet for a while in hopeless confusion. This confusion was increased when it was found that cavities are formed by disease in the cord, in complete independence of the normal central canal; and again, that the normal central canal may sometimes be dilated by disease into cavities. Simon, in 1875, arranged the subject in an orderly way. He observed that intramedullary cavities coexist with vascular tumors, to which he gave the name of vascular gliomata, and that the cavity results from the softening of the glioma. To avoid confusion, he proposed to restrict the term *hydromyelia* to a dilatation of the central canal from whatever cause; and to use the word *syringomyelia* to designate cavities formed in gliomatous material in any part of the cord. These views and this plan were endorsed by Westphal. It is thus seen that the discussion of terms, as is its wont, did not end until the observation of facts began. The works of Simon and Westphal stimulated the pathological and anatomical studies of these conditions, until we have now a certain amount of definite information, and can afford to let terms, neither of which are altogether pleasing or apposite, take the places designated for them. We have now come to the period when *syringomyelia* appears to be generally recognized as a disease-entity, and accordingly to have entered fully into its clinical phase.

The work of Dr. Bruhl is devoted to a lucid and exhaustive discussion of the whole of this important subject, and is a conspicuous example of a class of works in which the French excel. We mean elaborate monographs upon special themes, and which are of much interest and importance to us in this country, who are too apt to rely upon journal articles and over-crowded text-books for our knowledge.

The part of Dr. Bruhl's work which has interested us most is the

chapter on symptoms. We had an idea that the symptoms of syringomyelia are very "mixed" and indefinite—in fact, that it is often impossible to determine in life the existence of this lesion. This is chiefly because of the various positions in the cord which the cavity may occupy, and hence the very great variety of symptoms to which it may give rise. In this respect we judged it to be like other adventitious products in the cord, which may originate many combinations of symptoms, according to the level and the area which they occupy. We were, therefore, scarcely prepared for the classified list of symptoms which the author presents as characteristic. As the subject is important, we briefly give the list. Dr. Bruhl makes two divisions: (1) The "intrinsic," including, first, the symptoms of anterior poliomyelitis, especially progressive muscular atrophy of the so-called Aran-Duchenne type. Second, symptoms of posterior poliomyelitis, causing anæsthesia to pain, and to heat and cold, without abolition of tactile sensibility and the muscular sense. This is what Professor Charcot has called the *dissociation* symptom of syringomyelia, and, as it is claimed to be especially characteristic, it deserves especial notice. Third, symptoms of median poliomyelitis, such as trophic disorders of various kinds. These three groups of symptoms are what mark syringomyelia as a distinct disease. The second division, or (2) "extrinsic" symptoms, contains only such as complicate and disfigure this clear clinical picture. These are, first, spastic paralysis, due to sclerosis of the lateral tracts; and, second, symptoms of locomotor ataxia due to involvement of the posterior white matter. The author describes these various symptoms in detail, and, it is but fair to say, makes judicious allowance for variations and exceptions in clinical experience. The impression made upon us is that he includes so much in his symptomatology, making room, in fact, as he does in the above list, for every isolated symptom as well as for all systemic diseases of the cord, that while it looks very fair in a well-arranged table, in clear type, it will, nevertheless, be possible to include within these wide limits widely differing diseases, and that the subject is not yet sufficiently simplified to insure in every case even an approximation to a positive diagnosis, in the hands of the most expert. If this opinion, which we think will be shared by many clinicians, shall prove to be incorrect, we believe the proof will be due in some measure to the carefully-written book now before us.

Dr. Bruhl's chapters on the pathological anatomy and pathogeny of syringomyelia are also of great interest. He passes briefly in review all the opinions and theories which have been held by eminent observers upon these subjects, and announces early his own opinion that the term syringomyelia should be restricted to the cavity formed in gliomatous material. Hence, his book is really a treatise on what would more appropriately be called *gliomatosis* of the spinal cord—a term employed not infrequently by Dr. Bruhl himself. This condition, according to Leyden, is probably congenital in the great majority of cases, and to be understood intelligently must be traced back to the embryonal period of the cord. When the primitive groove in the embryo is closed in by the growth and junction of the postero-lateral columns a small canal is left, which persists as the central canal of the cord. This canal is surrounded by a translucent embryonal tissue, which persists for a long time, or is gradually transformed into neuroglia. This tissue is almost, if not quite identical, as the author shows, both microscopically and

chemically, with neuroglia—and, what is practically the same, with glioma. In this gray tissue, which especially surrounds the central canal, the process of cell-proliferation—which has been called gliomatosis—occurs. It probably occurs especially in cases in which there has been some congenital defect in the closing in of the primitive groove forming the cord. The cell-growth may in some cases result in veritable tumors, while more commonly the new tissue softens at the centre, various sized and shaped cavities resulting. These cavities may or may not be connected with the central canal—if they are, they show some remains of epithelial tissue. It is thus seen that the important pathological fact is the embryonal origin of the disorder in a proliferation of gliomatous tissue, which has been, as it were, “left over”—and that the connection or not with the central canal is of secondary importance. It is not denied that cavities may be formed in the cord in other ways, as, for instance, by a limited hæmorrhage, or possibly by a circumscribed myelitis, but these lesions are not to be confounded with syringomyelia, the result of gliomatous changes. We have given here the opinion, not exactly as expressed, of Dr. Bruhl, and as held especially by those who accept Leyden’s view of the congenital origin of syringomyelia—with which view our author is apparently in accord, as he speaks of syringomyelia as a disease of evolution. The absence of predisposing causes, the commencement in early life, and the slow progress of the disease, favor this view. It is almost needless to say that the prognosis of the disease is not good, and that treatment is not of much avail.

Dr. Bruhl’s book is enriched by the reports in detail of thirty-six cases, some of them published now for the first time, and some of them the results of his own personal observations. A very copious bibliography is also attached. The work is altogether a notable contribution to the study of the subject of which it treats.

J. H. L.

HYSTÉROPEXIE ABDOMINALE ANTÉRIEURE ET OPÉRATIONS SUS-PUBIENNES
DANS LES RÉTRO-DÉVIATIONS DE L’UTERUS. Par MARCEL BAUDOUIN,
Avec Vingt-deux Figures dans le Texte. Paris : Aux Bureaux du Progrès
Médical.

ANTERIOR ABDOMINAL HYSTEROPEXY AND SUPRA-PUBIC OPERATIONS
FOR RETRO-DEVIATIONS OF THE UTERUS. By MARCEL BAUDOUIN.
Pp. x., 414.

To many persons with whom even the name of the operation described in this work is a stranger, it would indicate remarkable fertility of resources that one should be able to write a book of 414 pages upon this subject. The name, indeed, is ultra-modern, and the synonym, hysteror-rhaphy, by which the operation is best known to English and American readers, is equally modern. Indeed, the author, claiming French parentage for the operation (and what French writer does not claim such parentage for most surgical procedures that have been launched in recent years?) can give it no more respectable antiquity than 1869, when

it was performed by Köberlé. A synopsis of the book yields the following data :

Discussion as to the terminology of the operation, preference being accorded to the phrase *anterior abdominal hysteropexy*.

History of the operation with its modifications.

Description of the various types of hysteropexy, both intra-peritoneal and extra-peritoneal.

Contrast of the operation with those operations and means which have been proposed as substitutes, including the use of pessaries, and the various methods for fixing the uterus in proper position by operative procedures upon the broad, round, and utero-sacral ligaments, and by the attachment of the uterus to the bladder.

Value of the operation judged by the record of 233 published cases.

Comparative value of this operation with its substitutes, preference being given to this operation. Table of cases, bibliography, etc.

The conclusion has gradually been forcing itself upon the minds of gynecologists that retro-deviations of the uterus are very imperfectly and unsatisfactorily treated, in the main, by means of pessaries. They often make matters worse, occasionally relieve symptoms, seldom effect a radical cure. We do not mean that a cure is impossible by their use; we have seen cures.

A break in the direction of more effective treatment came with the Alexander operation, which is often difficult to perform, frequently is performed imperfectly, and sometimes fails to cure under the most skilful surgery. As the surgery of the abdominal cavity developed, especially the surgery of the tubes and ovaries, and the fear of peritonitis disappeared under antiseptic or cleanly manipulations, the opportunity was presented for the great variety of procedures which seemed to offer definite prospects of curing retro-deviations of the uterus, whether the organ were mobile or fixed by adhesions and exudates. It is not necessary to describe or even mention the great number of propositions varying only slightly from one another for securing the uterus to the anterior abdominal wall. They are none of them especially difficult of accomplishment, the principle in all is the securing of adhesive union between the peritoneum covering the anterior aspect of the uterus and the contiguous peritoneum of the anterior abdominal wall by sutures including more or less of the uterine tissue and more or less of the tissue of the anterior abdominal wall, abdominal section being presupposed, of course, and the sutures being removed as soon as firm adhesion was supposed to have occurred. There are many objections to this operation: first of all, it violates anatomy, fundamentally, by substituting one vicious position for another. This, we admit, is not universally an insuperable objection, for a number of examples will at once recur in which such a makeshift has been the best that art could do with the materials and conditions at hand. Another objection is, that in a great many cases the success of the operation will be transient. There is not a little testimony on the part of those who have done the operation repeatedly that the area of attachment gives way. The recent history of the radical operations for hernia would lead us to expect such a result. Moreover, what is the bond of attachment but plastic matter, which like plastic matter elsewhere degenerates, is absorbed, disappears? Then if there is no other support the organ will drop back to its old position. The supervention of pregnancy need not be a serious objection in so far as

position is concerned, for the enlarging organ, even if it broke from its mooring, might have sufficient firmness to prevent backward displacement. The irritation which might lead to miscarriage is an evil of a different character concerning which sufficient evidence has not been adduced to satisfy us that it is altogether theoretical. So of the possible displacement and irritation of the bladder, the proof is not yet sufficient that evils of this character would not occur.

Preferable to this operation, as it seems to us, assuming that it is decided to treat the uterine displacement through the medium of an abdominal section, are the operations upon the uterine ligaments. In this opinion we are at variance with the author. If the tubes and ovaries have been removed we can hardly see the necessity for any further operation, for when circum-uterine adhesions are ruptured, and the broad ligaments contracted by the formation of stumps for the adnexa, we have usually observed that such means were sufficient to bring the uterus into proper position; besides, atrophy of the organ will occur in a more or less brief period, and then the position of the uterus will, in most cases, be a matter of little importance. Of the intra-abdominal operations upon the round ligaments for the remedy of retro-deviation of the uterus, by far the most practicable and simple means seems to us to be that which was devised by Wylie. In simply drawing up and stitching a segment of each round ligament no false anatomical relations are introduced, a reasonable prospect of permanency of result is given, and the operation is very easy of accomplishment.

The author has not succeeded in convincing us of the extraordinary value of hysteropexy. It may continue to be done as many other imperfect and illogical operations continue to be done, but we are satisfied that the results will very often cause disappointment, and thus may possibly stimulate to the discovery of more perfect measures.

A. F. C.

A TREATISE ON GOUT. By SIR DYCE DUCKWORTH, M.D. Edin.; M.D. (Hon. Causá) Royal University, Ireland; Physician to, and Lecturer on Clinical Medicine in St. Bartholomew's Hospital, etc., etc. With Frontispiece and Illustrations. 8vo., pp. 476. London: Charles Griffin & Co., 1889.

It is a noteworthy fact that by far the greater number of the contributions to the literature of gout have been written by British authors, and that, of these, a majority emanate from London. The explanation of this fact is not far to seek. There can be little doubt that London affords the largest and densest field for the observation of gout and gouty ailments, and the London hospitals fuller opportunities for the study of the morbid anatomy of gout than can be had elsewhere. These conditions enlarge experience and stimulate investigation. The result is that the medical profession of the world turns to London for light upon this subject, and does not turn in vain. But the light is by no means a flood. It glimmers at many points, and here and there is bright enough to steer by. But more is needed. The saying of James Begbie, that the history and nature of gout have yet to be written, still holds good. Facts accumulate, theory crowds upon theory, but the

comprehensive generalization, large enough for all the phenomena, simple enough for an underlying pathological law, awaits formulation. This is true not only of gout, but also of the other constitutional arthropathies.

We do not enter into sympathy with the author of this noble book in the feeling which prompts him to speak apologetically of his intruding himself into the company of authors who have written upon the subject of gout. We accord him the fullest sympathy for his patient and painstaking labor; the keenest appreciation for his scholarly research and critical acumen; the highest honor as a broad-minded and faithful worker in the field of clinical medicine. He has added new facts to the general fund of knowledge, and, by an elaborate and critical analysis of the theories of gout, cleared the way for future work. Certainly the light upon the subject is, through his labors, both brighter and more extended.

The last upon the subject, the treatise before us is, to our thinking, the best. Written in the broad spirit of one who rises above the narrowness of specialism, it has place for all reasonable views, however discordant; for all well-observed facts, however difficult of inter-adjustment; yet it is well ordered, and most readable. The pages of the JOURNAL do not afford space for an extended review of this book—a task that, in the days of the quarterly, would have been a labor of love—nor is the reviewer content with brief notice of it. In these days of much writing brevity must control the pen. In medical literature the fashion of writing books about books is passing away. Perhaps it is well that it is so, but one regrets the critical review, its opportunities for elaborate analysis, for keen satire, for trenchant rebuke, for discriminating praise—in a word, for display of the critic's resources.

To content one's self with saying of a good book that it is really good, that it has been written by the light of truth, that it represents intellectual outlay and hard work, that it has in it the individuality of the author, and, finally, that it should be read by everyone interested in the subject—all this seems too little. But this we say of the treatise before us, and we say it earnestly.

J. C. W.

PRACTICAL ELECTRICITY IN MEDICINE AND SURGERY. By G. A. LIEBIG, JR., Ph.D., and GEORGE H. ROHÉ, M.D. Philadelphia and London: F. A. Davis, 1890.

BEFORE critically examining this clearly printed and illustrated book, we should not fail to reflect that this is the first work covering the whole field of medical electricity that has appeared during the present electrical era. Apostoli's writings and Massey's *Electricity in the Diseases of Women* are, of course, excepted as dealing only with a special field. All other comprehensive treatises of any pretension belong to a period that antedates the dynamo, the electric light, the telephone, and the other discoveries and applications in electro-physics that have practically re-created the science; a fact that relegates them, one and all, to the position of historical curiosities. Excepting in their clinical and experimental departments, which contained much of permanent interest, the

resemblance of these works to the electric science of the day was not closer than that of alchemy to modern chemistry.

At this auspicious moment the appearance of a scientific treatise—such as the one under consideration—is most welcome, and as electro-therapeutic science has been more progressive than its text-books it will be eagerly perused by a large circle of readers. It can also be read and understood by the non-medical electrician, which is somewhat novel with works of the kind.

In estimating the value of such books to the profession, however, other qualities than those of mere scientific accuracy count for much. Unless the important facts are presented in simple, direct language, unaccompanied by trivial details, their teaching-power is greatly curtailed. In the present work, Part I., devoted to a scientific explanation of the principal facts of physical electricity, presents the greatest contrast to former text-books, the underlying principles of electricity and magnetism, of induction-coils, batteries, electric units, motors, dynamos, electric lighting and telephony being thoroughly presented. Yet this very thoroughness and comprehensiveness has certain disadvantages in practice. What progress would be made in the use of the recent synthetic drugs, for instance, if the physician must perforce wade through all the methods and apparatus used in the production of sulphonal, phenacetin, etc., before being permitted to use them? It is to be regretted that the authors of this work did not understand that a busy, practical physician has no more interest in the details governing the construction of galvanometers and batteries than he has in similar facts concerning pills and extracts. Such things come to the physician ready-made, and he is only interested in their choice and proper handling. These never-ending details about the apparatus for producing currents, have been like a millstone about the neck of electro-therapeutics; what the physician wishes to know is not how to make these currents but how to use them. The folly of such wasted energy is well illustrated in the space devoted to the centigramme-gramme-second system of electric units. What work on pharmacology or materia medica troubles us with the reasons *why* a pound is a pound or a foot a foot? These questions belong to treatises on pure electricity or mensuration, and like much other matter in the first part of the book are impediments to a work on an applied science. That the specialist should understand them is undoubted, but for him such elementary details are insufficient. If they were needed in a book for the general profession, reason would dictate simpler methods of explanation than algebraic formulæ. The chapter on cells and batteries reproduces the mistakes of other works in elaborately describing obsolete cells that are totally unfit for medical work, while those that are in daily use by most physicians are scarcely mentioned.

Part II. relates to electro-physiology, electro-diagnosis, and electro-medical apparatus. The first two subjects are presented with unusual clearness, but why another instalment of apparatus descriptions should appear in this place is not clear. Under the head of electro-physiology the brief summaries of the observed effects of currents on various healthy internal organs are most excellent, and should be read by anyone doubtful of the powers of this agent. Nothing could be more to the point than these terse notes of actually observed organic stimulations, the list beginning with the heart and ending with the ureters. The tone of these notes is commendably modest in giving full mention of negative as well

as positive results. The chapter on electro-diagnosis, if carefully read, will also be found to simplify a subject that has been too often weighted with unnecessary verbiage. A useful addition to this part is an account of the uses of the electric light as an aid in diagnosis.

But it is in Part III.—the application of electricity to the treatment of disease—that greatest interest will centre. Excluding the first chapter, which is introductory, this comprises just 100 pages out of a total of 383—a space that is relatively small though filled to great advantage. The style adopted is exceedingly practical and to the point, exact directions being usually given under the heading of each disease. An admirable feature of this part is the appending of an opinion of the success of treatment to nearly every disease considered. These prognoses seem in the main to be just, though they are doubtless meant only in a general sense. In the department of diseases of the skin the work is particularly good, and it is to be hoped that dermatologists will now no longer neglect so important an aid in their work. The departments devoted to electro-gynecology and urethral electrolysis, on the contrary, are largely made up of quotations, and, though reasonably full, fail to give evidence of that personal familiarity with the work that is so important in these semi-surgical fields.

Not the least admirable feature of the work is the successful achievement by the authors of their expressed aim—that nothing untrue should be contained within the covers of the book. Its proper conservatism is a distinct charm that commends it most warmly to fair-minded men.

G. B. M.

THE RHEUMATIC DISEASES (so called). By HUGH LANE, L.R.C.P. Edin., M.R.C.S. Eng., and CHARLES T. GRIFFITHS, L.R.C.P. Lond., M.R.C.S. Eng. 12mo., pp. 128. London: J. & A. Churchill, 1890.

OSTEO-ARTHRITIS. By JOHN KENT SPENDER, M.D. Lond., Fothergillian Gold Medallist of the Medical Society of London; Physician to the Royal Mineral Water Hospital, Bath. 12mo., pp. 61. London: H. K. Lewis, 1889.

MASSAGE AND THE ORIGINAL SWEDISH MOVEMENTS. By KURRE W. OSTROM, from the Royal University of Upsala, Sweden; Instructor in Massage and Swedish Movements in the Hospital of the University of Pennsylvania, and to the Philadelphia Polyclinic; etc. 12mo., pp. 97. Philadelphia: P. Blakiston, Son & Co., 1890.

THE first two brochures, by authorities with rare opportunities for personal clinical research in this particular branch of the study of medicine, cannot fail to be of great interest and practical utility to all general clinicians and surgeons.

The first, upon the Rheumatic Diseases (so called), is the more comprehensive, and deals particularly with the question of what constitutes the difference between chronic rheumatism, chronic rheumatic arthritis, chronic rheumatoid arthritis, and chronic gout. The vast experience of these gentlemen, obtained from a wide field of investigation afforded by the study of about three thousand such cases, all, or

nearly all, of which have been under supervision in such a manner as to furnish an opportunity to observe their daily progress through a period averaging about six weeks, enables them to speak authoritatively on these subjects. Some very interesting facts are elucidated, particularly upon the etiology of these singular affections.

Speaking of rheumatoid arthritis in relation to acute rheumatism, they have concluded that it is not a sequel of acute rheumatism, nor, in the majority of cases, is there any connection whatever between them. They have advanced the theory that it is a disease built up by the *hereditary taint of gout and phthisis*, particularly the latter diathesis, which is regarded in the direct light of cause and effect, and that the nervous phenomena in connection play a most important part. Osteo-arthritis is considered as an advanced stage of chronic rheumatoid arthritis, in which the inflammation of the non-bony structures has extended ultimately to the bones themselves; in other words, rheumatoid arthritis and osteo-arthritis are respectively the first and second stages of one—a debilitating—disease, these stages being somewhat separated by an interval of comparative freedom from pain and discomfort.

Likewise chronic rheumatic arthritis is considered an arthritis which follows an attack of acute or subacute rheumatism, whether gradually merging into arthritis, or happening some considerable time before the joint trouble becomes manifest.

Drs. Lane and Griffiths have further adopted an arrangement whereby, they cannot help thinking, more definite clinical facts are brought forth—by using the above terms (chronic rheumatism, chronic rheumatic arthritis, chronic rheumatoid arthritis, and chronic gout), for precisely, as far as they can, the symptoms which obtain; for instance, speaking of osteo-arthritis as an arthritis in which bony mischief is the most prominent, and which is the later stage of rheumatoid arthritis; speaking of rheumatic arthritis in those cases only which have been preceded by distinct rheumatism, purposely leaving the word rheumatoid to be dealt with subsequently.

The symptoms of all these affections are clearly described, and the differential diagnosis distinctly drawn. These clearly-defined differentiations are what have long been demanded in rheumatic diseases (so-called), and much direct and permanent benefit may be expected from the influence of an authoritative work of this kind.

The second work is offered as a contribution to the clinical history and the rational treatment of osteo-arthritis. In it Dr. Spender has made an effort to identify osteo-arthritis in its very cradle, and to draw sharply the lines of boundary between it and all other diseases which resemble it, and as this is the all-important period in this disease—the only period in which therapeutic means can be employed with any advantage, an authoritative work upon this subject assumes great importance. The author has admirably fulfilled his task, and produced a book that is lucid, interesting, and instructive.

The early stage of osteo-arthritis (or rheumatoid arthritis, as Drs. Lane and Griffiths would designate it) is clearly described, and the characteristics by which it can be diagnosed are emphasized. The theory is advanced that there is a large and hitherto undescribed group of cases in which the pathology of the joints is merely one sign of a profound disorder; synthetically osteo-arthritis is not built out of pulse,

pigment, perspiration, or pain; the erring anatomy must be present. Under treatment, general therapeutics, hygiene, etc., are not neglected, but Dr. Spender directs particular attention to local treatment, placing this properly in the foreground. Speaking of massage, it is gratifying to observe that the efforts of Weir Mitchell and others in America to rescue massage from the charlatan, and to elevate it to the dignity of a professional art, are acknowledged.

The importance of massage as a therapeutic means in early osteoarthritis, as well as in other chronic affections, is being gradually appreciated, and its universal employment may be early expected.

This tendency to elevate massage to the dignified position it should properly occupy will be also enhanced by the small work upon *Massage and Original Swedish Movements*, recently published by Ostrom.

This little book endeavors to show how the movements are applied to all parts of the body, and also to show for what diseases such manipulations are indicated. The procedures employed in massage are clearly described and illustrated, but the general active movements, those performed by the patient exclusively, are conspicuous by their absence. These are quite as important as the general passive movements, and should be included in every work upon this subject. On the whole, this little brochure is well adapted as an introduction to the more comprehensive works.

J. K. Y.

ON APHASIA, OR LOSS OF SPEECH, AND THE LOCALIZATION OF THE FACULTY OF ARTICULATE LANGUAGE. By FREDERICK BATEMAN, M.D. Second edition, greatly enlarged. London: J. & A. Churchill, 1890.

THIS book is largely a review of the literature of aphasia. It is the second edition of Dr. Bateman's work, the first having appeared in much smaller size twenty years ago. The plan of the present edition is that of a compilation, with running comments and some clinical observations of the author. While it thus presents nothing strikingly original, and cannot be said to advance our knowledge of the subject very far, it is nevertheless a book of merit, and will probably be read with interest by many who study this complicated subject. This is chiefly due to the fact that it collects so much in one volume. If we have any adverse comments to make, it is that we sometimes miss the exercise of the author's best critical and analytical faculty in the selection and digestion of the materials of his book. It is well known that many, and especially the early clinical reports of cases, even with autopsies, cannot be much relied upon to prove or disprove localization or functions in the brain cortex. Dr. Bateman has drawn quite extensively upon these in some parts of his book, and has given many of them in unnecessary detail. So, too, in the report of his own cases he is very diffuse, and commits the error of giving a minute daily history of patients, when all that is wanted is a concise summary of the chief facts. Hence the book lacks condensation—a fault that is apparent all through it. Hysterical mutism and deaf-mutism are dwelt upon at some length, but can scarcely be regarded as closely allied to true aphasia.

Dr. Bateman follows closely Ross, Charcot, and Bastian in his definition of the various forms of aphasia and their localization in the brain cortex. He is careful to give his own opinion, however, that the whole case is still "not proven."

Aphasia is divided into two groups—motor and sensory. The lesion of true motor aphasia, or *aphemia*, is located in the posterior end of the third frontal convolution of the left side. Agraphia, or inability to write, which is often, but not always, associated with aphasia, is due to lesions in the posterior part of the second frontal convolution. The sensory forms are subdivided into word-blindness and word-deafness, and the lesions are located respectively in the angular gyrus and in the three temporo-sphenoidal convolutions. The author has dwelt almost exclusively upon cortical lesions, and, it seems to us, pays too little attention to lesions of connecting tracts in the white matter. He describes many varieties of these several forms of speech-defect, his book being very complete in this respect.

The author calls attention frequently to the fact that he employs the term aphasia in its "widest and most general sense." He uses the word, in fact, to cover all forms of loss of speech, and this inexact use of the word is, in our opinion, the cardinal defect of the book. This is shown, for instance, in the chapters on the etiology, diagnosis, and jurisprudence of aphasia, in which the author treats largely of hysteria, fright, worms, constipation, reflexation, deaf-mutism, belladonna, alcohol, certain of the infectious diseases, the puerperium, blood-poisoning, and snake-bite as causes of various kinds of speech-defect. To include all possible affections of speech produced by such diverse causes under the generic term "aphasia" is, we submit, to misuse that term and to leave a very confused idea in the reader's mind of the exact seat and pathological anatomy of the particular lesion which Dr. Bateman at any time may mean. Certainly the loss of speech from fright, its suppression in hysteria, its confusion in alcoholic intoxication, its non-existence in deaf-mutism, are all very different from the loss of the speech-faculty due to a few limited cortical lesions which we have learned to call "aphasia."

We have felt it incumbent upon us to point out this peculiarity of the book because others may be disappointed, as we have been, to find that the volume is not limited to a critical digest of the subject of its title-page, but is burdened with much irrelevant matter. Such a digest, at this time, we believe, would be well received. We have, however, no intention to dispraise a really good and interesting book, which shows every evidence of laborious research, conscientious endeavor, and a wide and ready culture.

J. H. L.

A MANUAL OF ORGANIC MATERIA MEDICA. By JOHN M. MAISCH, Ph.M., P.D. Fourth edition. Philadelphia: Lea Brothers & Co., 1890.

FORMER editions of this work have been given such favorable reception that it seems unnecessary again to enumerate the valuable points of Prof. Maisch's book. Suffice it to say, that there is in no language a work which treats upon organic *materia medica* with as much precision and thoroughness compatible with its brevity. That it should have gone

through four editions in eight years is evidence enough that it fills a want and is appreciated by students. The publisher's part of the work is especially well done, both typographical matter and illustrations being of the highest order. It is to be regretted that organic materia medica seems to be drifting further and further away from the studies at our medical schools, although army and navy examining medical boards require a knowledge thereof. To the physician or student of medicine interested in the study of this subject this work will prove of the greatest value.

L. W.

TEXT-BOOK OF MEDICAL CHEMISTRY. By ELIAS H. BARTLEY, B.L., M.D.
Second edition. Philadelphia: P. Blakiston, Son & Co., 1890.

THE second edition of this well-known work comes to us revised and improved. The change in the classification, in accordance with the periodic law, certainly enhances its value as a text-book on modern chemistry, as also does the addition to the chapter on ptomaines. The enlargement of the part treating on the subject of poisons, and the addition of a "short" chapter on urinary tests, make it more valuable as a medical chemistry than could be claimed for the first edition. In view of the fact that the chemistry of the urine is one of the most important applications of chemistry to medicine, it is to be regretted that the chapter on this subject should be admittedly brief, while technical processes, quite useless to the physician, receive undue prominence. The introduction of the cuts illustrating the manufacture of coal-gas and nitric acid, etc., might well have been omitted. The frontispiece illustrating absorption spectra does little credit to the publishers, and after a successful first edition could have been expected to be superseded by a colored plate. The glossary of unusual chemical terms seems out of place in a text-book on chemistry, as these terms might well be looked for, if needed, in medical dictionaries. Dr. Bartley's work is one of undoubted merit and will prove a reliable guide for the student of medicine.

L. W.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

HYDRONAPHTHOL IN THE TREATMENT OF ENTERIC FEVER AND OF DIARRHŒA.

Some experiments on the effect of hydronaphthol upon digestive processes seem to show that it has a very distinct retarding influence on the digestion of egg-albumen by peptic fluids, and a very slight effect upon milk by the same. On the pancreatic digestion of milk or albumen and on the conversion of starch into sugar it has no effect.

It is therefore inferred by DR. J. MITCHELL CLARKE that hydronaphthol may be given to patients who are taking milk only without fear of interference with digestion. If there should be sickness whilst it is being administered, it is probably due to retardation of peptic digestion and accumulation of undigested curd in the stomach. In the latter case the remedy may be given in pill-form, coated with kreatin, in order that it may pass through the stomach and first be set free in the duodenum. Generally it was prescribed in gelatin capsules or simply suspended in milk. Two or three grains every two hours is a sufficient amount; in diarrhœa, after the first three to six doses it may be given every three to four hours, provided the effect is maintained. For children under one year the dose is half a grain, to older children one-half to one grain every hour or every two hours, or less often, according to circumstances.

Five cases of typhoid fever were treated with hydronaphthol and all of them did well. Nausea was troublesome in two of the patients. It is best to begin with grs. iij or iv every two hours in cases of enteric fever, and when the diarrhœa is checked to give the same dose every three hours during the whole period of pyrexia.—*Practitioner*, July, 1890.

TEMPORARY BLINDNESS FROM QUININE.

An unusual case of blindness following the use of quinine is reported by DR. FLAVEL B. TIFFANY in the *Denver Medical Times*, June, 1890. The patient, a lawyer thirty-four years old, had been in the habit of taking quinine in small doses, from which he promptly got the physiological action.

On the evening of February 18th the following prescription was ordered:

R.—Quinæ sulph. grs. xl.
 Opii et ipecac. comp. grs. xij.—M.
 Ft. capsul. viij. Sig. Two capsules every three hours.

The patient took within eight hours, beginning at eight on the evening of February 18th, a total of thirty grains of quinine in divided doses. Half an hour after the last dose he was able to tell the time by his watch, but four hours later he was totally blind.

On the morning of the 19th the pupils were fully dilated and non-responsive to light. He was unable to recognize even a pencil of light when flashed into the eyes by an ophthalmoscope. The optic nerve and retina were blanched and anæmic.

On the 21st the patient could recognize a flash of light. The retina was still anæmic, the veins greatly engorged and tortuous. On the night of the 23d he could count fingers, if before a bright light. On the 28th he could make out the headings of newspaper articles. On March 1st objects could be seen more plainly, and the retina had regained to some extent its normal color, yet it was blanched and the disk was especially anæmic. Four days later he could read an ordinary newspaper, but as though he were reading by twilight. By March 24th the vision had greatly improved, of the right eye $\frac{3}{4}$ th, of the left $\frac{2}{3}$ th, but the perimeter revealed a limited field of vision, especially in the vertical direction of the peripheral field.

SIEGESBECKIA ORIENTALIS IN DERMATOLOGY.

In the island of Mauritius this remedy enjoys a reputation for the relief of certain diseases of the skin. HUTCHINSON has used locally a tincture of siegesbeckia in herpes circinata, sycosis, and pityriasis versicolor. It is said to act as a stimulant and parasiticide.—*Journal de Médecine de Paris*, June 22, 1890.

MEDICINAL GELATINS.

Of recent years UNNA, as is well known, has given much time to the study of these forms of applications.

These preparations are indicated in superficial inflammatory affections, when the skin is swollen, wet, and itchy. Very high temperatures and profuse sweating forbid their use.

For a general basis the following formula is given, the figures within parentheses being used when a hard zinc-gelatin is wanted:

R.—Zinc oxide 15 (10) per cent.
 Gelatin 15 (30) "
 Glycerin 25 (30) "
 Water 45 (30) "

In adding other drugs, the following directions may be useful :

(1) Cerussa, iodide of lead, white precipitate, sulphur, iodoform, chrysarobin, in fine powder, may be mixed in any proportion required. A proportion of five to ten per cent. added to soft zinc-gelatin is recommended.

(2) Carbolic and salicylic acids, resorcin, naphthol, creasote, and sulphide of potassium may be added to the hard gelatin in any proportion up to ten per cent.

(3) Fats, balsams, tars, and ichthyol all make the basis softer. The proportion added is usually from ten to twenty per cent.

(4) If we wish to combine drugs in 2 and 3, then the sum of the proportions must be attended to. For example, if resorcin and salicylic acid were both ordered, we should not prescribe more than five per cent. of each, if we wish the gelatin to form a good covering.

(5) Powders may be combined in any proportion.

(6) Tannin, pyrogallol, and oxide of mercury cannot be added to the basis.

(7) Corrosive sublimate, up to three per cent.; and camphor-chloral to two per cent.; ext. cannab. indic., from two to five per cent., may be used with soft zinc-gelatin.

The chemist is to dispense the different glues in pots, which are to be put boiling in water when the preparation is to be used. It is to be painted on the skin with a long-haired brush.

The diseases of the skin in which Unna's glues are recommended are :

Pruritus: Zinc-glue with ext. cannab. indic., chloral-hydrate, carbolic acid, creasote, salicylic acid, camphor, camphor-chloral, etc.

Artificial erythema and eczema: Two per cent. ichthyol, or five per cent. sulphur, instead of ordinary dusting powders.

Eczema intertrigo: Hard zinc-glue with ten per cent. ichthyol or five per cent. resorcin.

Eczema, with great itching: Two per cent. ichthyol or five per cent. ext. cannab. indic.

Peeling after acute eczema: Two per cent. ichthyol or resorcin, five per cent. sulphur, or one per cent. salicylic acid.

Ichthyosis: Two per cent. resorcin or five per cent. sulphur and ten per cent. fat.

Wounds and ulcers: Iodoform zinc-glue.

Acne pustulosa: After opening the pustules, paint with twenty per cent. bichloride of mercury, with or without two per cent. salicylic acid added to the zinc-glue.

The soft zinc-glue will form a useful protection to the sound skin near diseased areas to which strongly irritating applications have to be made.—*American Journal of Pharmacy*, July, 1890.

TREATMENT OF CHOLERA.

From his experience in India, where cholera is more prevalent than in England, SURGEON-MAJOR G. C. ROSS makes the following recommendations in regard to the treatment of this disease: Injections, subcutaneously, of atropine and morphine; the theory of the action of atropine being that it is an antidote for muscarine—an alkaloid which produces toxic symptoms—

analogous to those of cholera; muscarine being also found as a ptomaine of the decomposition of albumen by the microbe. The morphine is used to check the vomiting. As intestinal disinfectants, phenol and sulphuric acid are recommended. The diet of the patient should be rice-water and ice.—*Indian Medical Gazette*, April, 1890.

ALCOHOL AND ALCOHOLIC SOLUTIONS IN THE ABORTIVE TREATMENT OF HERPES.

In a thesis published by DR. DUPAS, of Lille, the following directions are given for the treatment of this common and often troublesome condition:

Alcohol of 90 per cent. strength, or a solution of two parts of resorcin to one hundred of alcohol, can be employed as a dressing; or, 1 per cent. of thymol, or 3 per cent. of menthol in 95 per cent. alcohol. If the solutions cause too much pain a little cocaine may be added. Compresses moistened in one of these solutions are to be applied upon the lesions, and over this spread some impermeable material, or absorbent cotton may be used. These dressings must be changed frequently during the day. The herpetic eruption aborts rapidly under this treatment. The element of pain is also subdued, and it is not rare to see rebellious neuralgias from herpes zoster give way in a few hours to this treatment.—*Journal of Cutaneous and Genito-Urinary Diseases*, No. 87.

CANNABIS INDICA IN THE TREATMENT OF GASTRIC NEUROSES AND DYSPEPSIA.

PROFESSOR SÉE has just published a long article on cannabis indica especially in relation to its uses in the above affections. Of the preparations of this drug the extracts are the best, and of these, three kinds are mentioned: An alcoholic extract (haschichine) prepared with strong, 90 degrees, alcohol; an extract made with alcohol of 60 degrees; and an extract prepared by dissolving the first, haschichine, in butter by the aid of heat. The relative strength of these is 100, 25, 5, the last having one-twentieth the strength of the first and may be given in quarter-grain doses administered three times a day. The so-called active principles, cannabine, cannabinon, did not give as satisfactory results as this extract.

It was used in inorganic affections of the stomach, including chemical changes in the gastric juice so frequent in dyspepsias, and gastro-intestinal neuroses unaccompanied by variations in the composition of the gastric juice. Among them are included those accompanied by painful sensations, localized or otherwise, spontaneous or set up by contact of food with the walls of the stomach, pyrosis, vertigo, migraine, insomnia, somnolence, palpitation, oppression, and the effects of gastro-intestinal neuroses upon the nervous system in general.

By means of this drug the painful sensations are relieved and the appetite is reestablished.

In cases the result of an excess of hydrochloric acid it is necessary to give large doses of bicarbonate of sodium at the end of gastric digestion—that is, about four hours after eating.

Briefly, *cannabis indica* may be considered a true gastric sedative, without the disadvantages of narcotics like opium and chloral, or absorbents such as bismuth, sedatives as the bromides, or other drugs like antipyrin.

Of course, the aid of other means of relief, such as alkalies in large doses, purgatives, or antiseptics, are required under suitable conditions, and it is requisite that a proper regimen should be followed.—*La Médecine Moderne*, July 31, 1890.

ETHER AS A MENSTRUUM IN MEDICATION BY THE SKIN.

SAWYER considers that there are in practice three obstacles to the absorption of a medicine through the skin: namely, the epidermis, the sebaceous secretion of the skin, and the relative insolubility of the drug which is employed in any particular case.

The ointments and oily liniments are a better vehicle for the introduction of medicaments through the skin than plasters which have lead-plaster as a basis.

After some observation and consideration, ether was thought the best menstruum at our disposal for the solution of many remedies designed for enepidermic medication, and after examining a large number of drugs, he has selected belladonna, iodine, menthol, and capsicum as suitable for external therapeutic employment in the form of ethereal tinctures.

He prefers to have the ethereal tincture of belladonna made from belladonna root, with camphor, of the same strength as the belladonna liniment of the British Pharmacopœia, using the officinal pure ether in its preparation instead of rectified spirit of wine.

To form an ethereal tincture of menthol, after many experiments a strength of one drachm to the ounce was fixed upon. This preparation can be readily applied as a paint to the skin, and is an efficient means of using menthol for its local therapeutic effects, especially for the removal of superficial neuralgic pains. It should be lightly painted over the painful part. The quick evaporation of the ether gives a grateful sense of coldness which supplements the analgesic action of the menthol, and allows the easy application of a succession of coats, which leave pure menthol in a finely divided condition upon the skin.—*Lancet*, July 12, 1890.

[The explosive nature of ether vapor should not be forgotten.—ED.]

PARAGUAY TEA.

CHARLES has recently made some analyses and tests with Paraguay tea or maté. Compared with tea and coffee, he finds the following percentages of caffeine and tannic acid:

	Per cent. Caffeine.	Per cent. Tannic Acid.
Tea	3.1	22.7
Coffèe (roasted)	1.2	5.8
Maté	0.79	21.9

Both maté and its alkaloid were given for some time to three young men, who undertook long walks and very long cycling rides at his wish and under

his direction. The results of experiments upon them and upon himself under similar conditions were of a most varied kind, but the general results appeared to be that the tissue-waste was to a large extent retarded; that with little or no previous preparation long journeys and most arduous tasks could be undertaken without apparent evil after-effects; that the restorative effects in states of mental and physical exhaustion were well marked; and that these sustaining and recuperative properties were retained. Further, that the chief results obtained were constant and rarely variable. But even in his comparatively limited experience, maté and its alkaloid seem to act somewhat differently in different individuals; in some the muscular, in others the nervous, and in others again the digestive system were chiefly affected.

As a substitute for tea, in patients who are great tea-drinkers, and who suffer from sleeplessness, headache, and constipation, maté was prescribed with success in a few cases. The insomnia, headache, and constipation were all relieved.

In seven other patients who suffered from severe nervous headaches, generally associated with constipation, and with whom tea and coffee appeared to disagree, it proved serviceable.—*British Medical Journal*, July 26, 1890.

ALLEGED DEATH FROM THE APPLICATION OF AN ARSENICAL PLASTER.

In the *British Medical Journal* of July 26, 1890, two cases of death are reported following the use of arsenical plaster over tumors. In both cases their use was at the instance of irregular practitioners.

BIBORATE OF SODIUM IN EPILEPSY.

This treatment of epilepsy has been in use by some practitioners several years, and recently DIJOUÉ has employed it in twenty-five cases of epilepsy in which the bromides had not been successful. The treatment was continued from four to seven months, and the dose varied from fifteen to ninety grains a day. In one case there was complete recovery, and eighteen were relieved. There seems to be little question that by means of borax we are able to diminish the number of attacks in many cases of epilepsy which do not yield to the bromide treatment.

The following formula is recommended:

R—Biborate of sodium, in powder	5ijss.
Glycerin	5jss.
Syrup of bitter orange	5ij.—M.
A tablespoonful contains 30 grains.	

—*Mercredi Médicale*, July 19, 1890.

THE TREATMENT OF DROPSY.

At a recent meeting of the Society of Medicine in Berlin, DR. FURBRINGER discussed the treatment of cardiac and renal dropsy. The fluid could be got rid of in four ways: 1, by the sweat-glands; 2, by the kidneys; 3, by the intestines; 4, by surgical means.

In cardiac dropsy diuretics hold the first place as does diaphoresis in dropsy of renal origin. In renal dropsy the speaker used heat as a diaphoretic; the chief contra-indication to its employment is cardiac weakness with dyspnoea. Pilocarpin had been abandoned on account of the dangerous symptoms sometimes caused by it.

Among diuretics digitalis is still the sovereign remedy, and it was of service also in renal dropsy and even in glomerulo-nephritis, for here cardiac debility often played a part.

In cases in which he had failed to obtain benefit from digitalis either in the form of infusion, powder, or pill, he had obtained excellent results with acetum digitalis in combination with wine of pepsin.

Drugs such as adonis, convallamarin, blatta, and spartein are superfluous; they too often failed, and there were frequently unpleasant concomitant effects produced by their employment. With lactose he had had no success, but to the following he gives some commendation: strophanthus, caffeine, theobromine, calomel, and the group of saline diuretics. The action of caffeine on the central nervous system was disagreeable, but this might be avoided by the use of sodio-salicylate of theobromine, or diuretine.

When drastic purgatives are employed the patient should be strong and have a good pulse. In transudating into cavities he believed in not puncturing too early.—*The Medical Press*, April 23, 1890.

HYPNOTICS.

The Report of the Therapeutic Committee of the British Medical Association on the use of sulphonal, paraldehyde, and chloralamide, is summarized as follows:

Attention was directed especially to the dose. Whether sleep is produced with certainty, how soon it comes on, and how long it continues.

Dangerous or disagreeable effects produced. Whether the drug loses its effect.

Sulphonal: In thirty-two cases, twenty grains were given in eleven instances, once at night. Sleep came on in half an hour to three hours; in one case in five hours, and in another in nine hours. A second dose on the succeeding night in one case produced sleep in five minutes. Sleep lasted in four cases all night; in four cases six hours; and in three cases one or two hours. With twenty-five grains (four cases) sleep came on in two hours, and lasted six hours, or all night. With ten and fifteen grains less sleep was produced, and in a case of pneumonia (fifteen grains) there was no sleep after the drug. The few cases (seven in all) in which thirty, forty, and sixty grains were given, showed that these doses did not possess greater hypnotic effect than a dose of twenty grains; as regards disagreeable after-effects, in six out of ten cases in which twenty grains had been given, disagreeable after-effects were noted; drowsiness next day was noted six times; giddiness four times; headache and incoördination of gait, each twice. In four cases in which ten grains had been given, drowsiness was noted once; in five cases with fifteen grains, drowsiness was noted twice and giddiness twice; with twenty-five grains (four cases), drowsiness was noted twice, giddiness once, headache once. In seven cases, with thirty to sixty grains, drowsiness was noted four

times, giddiness twice, headache twice, incoördination of gait and vomiting, each once.

Does the drug lose its effect? Several cases show that a second dose on the succeeding night has greater effect than on the first night. Thus, in one case, twenty grains produced on the first night two hours' sleep, with no bad after-effects; on the second, a similar dose produced eight hours' sleep, with drowsiness, giddiness, and incoördination of gait on the following day. In some cases prolonged use of the drug appears to diminish its effect. In one case of neurasthenia and insomnia, ten to twenty grains did not lose its effect during six months.

Paraldehyde: Single doses of forty to sixty minims (fourteen cases), produced sleep in five to fifteen minutes; in two cases in half an hour; in one case in an hour. In most cases the sleep was wakeful and restless, and lasted very varying times, in one case only three-quarters of an hour; in another case there was restless dozing for three hours, in another sleep for two hours; in ten cases sleep lasted from three to six hours, and in one case sleep for twelve hours. These results refer to single doses. Half a drachm every three hours produced within half an hour two hours' sleep; twenty minims every four hours for fourteen days produced better sleep at night, but not during the day.

Dizziness and drowsiness were noted each once, vomiting three times, and retching and nausea each once.

Chloralamide: In one case twenty grains, and in six cases thirty grains, were given in single doses. After the twenty grains, sleep came on in twenty minutes and lasted three hours, with half an hour's interval of waking; after thirty grains, sleep came on in fifteen minutes to half an hour (four cases), one to two hours (two cases). Sleep lasted all night in three cases, in two cases four or five hours, and in one case there was two hours dozing, then an interval of wakefulness, and then two hours sleep. No disagreeable after-effects were observed.—*British Medical Journal*, July 26, 1890.

ANTISEPTIC PROPERTIES OF ANILINE COLORS.

Both PROFESSOR STILLING, of Strasburg, and PROFESSOR SÉE, of Paris, have investigated the properties of some of these colors. In Paris, safranine, cyanine, malachite-green, and methyl-violet have been studied in solutions of the following strengths: 1 to 300, 1 to 2500, and 1 to 25,000. The toxic properties of these substances, their antiseptic power, and their influence on suppuration in animals were studied. Two of them, safranine and malachite-green, were tried with satisfactory results in solutions of 1 : 2500, as a douche, but in two cases only.

The aniline colors of the aromatic series, when free from phenol and arsenic, are not toxic in their action. As antiseptics, they vary in their activity, the most powerful being the methyl-violet, malachite-green, and safranine.—*La Miderine Moderne*, July 10, 1890.

POTASSIUM TELLURATE FOR NIGHT-SWEATS OF PHTHISIS.

This salt has been used by DR. EDMUND NEUSSER to relieve the night-sweats of phthisis. It is given in the form of pill, in doses of one-third of a

grain ; in the majority of fifty cases this amount was sufficient. In a small number of patients who became accustomed to its use after a week's time, doubling the dose produced satisfactory results. The drug seems also to have a slight narcotic action. There were no toxic symptoms except slight digestive disturbances, such as a coated tongue and loss of appetite. It gives the breath the odor of garlic, though this is usually unnoticed by the patient. — *Wiener klinische Wochenschrift*, June 5, 1890.

THE COMPARATIVE DIGESTIBILITY OF DIFFERENT STARCHES.

It is usually considered that the different starches are of the same degree of digestibility. The completeness of the digestion of starch is influenced by the amount of cellulose present.

In testing the digestibility of pure starches containing only a trace of pure cellulose, MARTIN found that the three most digestible starches are pea-starch and those contained in Bermuda and St. Vincent arrowroot. Barley-starch comes next, while rice, flour, and a mixture of rice-, potato-, and barley-starches come far behind the first three in digestibility. The differing digestibility in starches does not seem to depend on the physical structure of the starch-grain ; it is quite possible that the different starches vary in their molecular structure.—*British Medical Journal*, July 26, 1890.

MEDICINE

UNDER THE CHARGE OF

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THE CLINICAL VALUE OF THE DIAZO-REACTION.

RÜTIMEYER (*Correspdbl. f. Schweiz. Aerzte*, 1890, 306) reviews somewhat of the present state of knowledge regarding the diazo-reaction, and particularly the claim made for it by Ehrlich. Ehrlich, namely, showed as a result of a large number of examinations, that the reaction is one of the most constant symptoms of typhoid fever after the first week ; that when but little marked or not long persistent the disease would probably run a very light course ; that its presence in pneumonia indicates the existence of complications, and that its appearance in phthisis is a most unpropitious symptom.

Since the writings of Ehrlich several observers have reported long series of observations confirming his results, while others have come to different conclusions. Rüttimeyer himself has made 2750 examinations of the urine of 260 patients with regard to the diazo-reaction. He has used exclusively the method of preparing the reagent recommended by Ehrlich. The solution should always be freshly made by adding to 200 c.cm. of a saturated aqueous-

solution of sulphanilic acid, 10 c.cm. of pure hydrochloric acid, and 6 c.cm. of a one-half per cent. aqueous solution of chemically-pure sodium nitrite. If this solution be added to an equal volume of urine, and the mixture made alkaline with ammonia, a color varying from bright rose to dark carmine will be produced—the diazo-reaction. A further characteristic of the reaction is that after from twelve to twenty-four hours a sediment forms whose upper layer varies from bright green to violet-black. The author then analyzes his own observations, comparing them with those of others, and draws the following conclusions :

1. The diazo-reaction has great diagnostic value in typhoid fever, and is, with splenic enlargement and rose-colored spots, one of the most constant and earliest evidences of the disease.

2. Febrile abdominal catarrhs never give this reaction.

3. If we have to do with a commencing illness which we conclude is typhoid fever, the diagnosis gains greatly in probability through the discovery of the diazo-reaction. If, on the other hand, the reaction is absent during the first and second weeks, the disease is not typhoid at all, or only a very light attack of it.

4. The reaction bears no fixed relation to the course of the fever. It is not disturbed by different drugs or methods of treatment. The morning and evening urine give, on an average, reactions of equal intensity.

5. If the reaction ceases to be present in the second or third week a speedy disappearance of fever, or a mild attack of the disease, may be counted on. If it persist a long time, a prolonged or severe course is probable.

6. A well-marked and persistent reaction gives no clue for differential prognosis as to a lethal termination or final recovery.

7. Relapses gave the reaction, almost without exception, if it had already disappeared.

A STUDY OF ALCOHOLISM.

C. L. DANA (*New York Med. Journ.*, June 14, 1890) publishes a study of alcoholism as based upon a record of 3735 cases occurring in the Bellevue Hospital "Cells." Most cases of simple intoxication arrested in New York City do not reach the hospital; only those being sent who are suffering from the effects to such an extent that they evidently need medical care. Three-fourths of them are men; and the majority are between the ages of thirty-one and forty years. The mechanics, tradesmen, and artisans furnish a greater proportion than do the day laborers. The number varies little month after month, though perhaps greater in summer. Fully one-half are Irish, and of the native-born the majority are of Irish parentage.

The patient has usually been drinking two or three weeks before reaching the "cells," until at last he can no longer eat, and even liquor is not well retained. He commences to tremble, cannot sleep, and yet is exhausted for want of it. He is oppressed with dread, and has hallucinations. Still the real delirium has not yet commenced, but begins about twenty-four hours after abstinence from liquor. In fact, the delirium is partly due to the withdrawal of the stimulant, and partly to the starved conditions of the nervous tissues. The popular idea that visions of snakes predominate is not correct.

The hallucinations and delusions are mainly those of being pursued by something; very often the fear of fire is dominant. In the majority of cases the delirium lasts only from twenty-four to forty-eight hours. The patient then gradually quiets down, and when he has had a good sleep convalescence begins.

Nearly five per cent. of the patients, however, die in the cells of exhaustion, besides a large number which are transferred to the wards of the hospital and there die of the peculiarly fatal alcohol pneumonia, or develop low, muttering delirium, slight fever, and finally die of exhaustion. In about 300 to 400 cases one instance of alcoholic neuritis is found, generally in a woman. Alcoholic paralysis, however, more often occurs in those who have not become distinctly alcoholic. Acute alcoholism is not a very frequent cause of insanity, but is an important one.

The cases of acute alcoholism seen in the "cells" may be divided into several forms:

1. Simple drunkenness, or acute alcoholic intoxication, occasionally with lethal poisoning.
2. Delirium tremens of the ordinary type.
3. Febrile delirium tremens, with decided fever, excessive and general tremors, rapid loss of strength, and profuse sweats.
4. Cases of true *mania a potu*, or delirium inebriosum.

Distinction is also to be made between patients who are dipsomaniacs and those who have simply been on a "gigantic spree." A considerable minority of the cases observed were of this latter class.

A careful distinction between the different forms might lead to more brilliant therapeutic results than are now obtained. Thus simple drunkenness requires little medication. Febrile delirium tremens is excessively fatal, and demands careful watching; while the patient cannot stand powerful hypnotics like morphine and hyoseyamia. *Mania a potu* is the result of a very little alcohol acting upon a hyperæsthetic and highly predisposed organism; and sedative drugs and nourishing food are demanded.

The mortality of the cases observed was considerable. Including those which died of pneumonia, it must have equalled nearly 10 per cent.

The treatment generally to be employed consists in at once stopping alcohol, unless there are such complications as pneumonia. Powders of bismuth and capsicum or rhubarb and soda are given if food is rejected. A mixture of chloral and bromide, sometimes with paraldehyde, is administered every two hours until sleep is produced; or, if this is insufficient, a hypodermic injection of morphine and amorphous hyoseyamine is employed. It is necessary to restrain most patients by tying them down, or better, by placing them in a padded room on a large mattress. Despite all that can be done, the patient will sometimes not sleep except when narcotized, and the delirium continues and death ensues.

Cases of alcoholism are more numerous than formerly, and are yearly increasing.

As regards prophylaxis, the author claims that long "soaking" with liquor for at least a week is necessary to develop an attack of delirium tremens, and that it is cheap and poisonous liquor which is particularly liable to bring it on. There is, however, no salvation even in pure spirits or in malt liquors.

or light wines, for, although these latter drinks are relatively harmless in Europe, they are not well borne by Americans. In the present state of public opinion, at least, the sale of new whiskey and of cheap, stale, and unripe malt liquors should be prohibited.

THE RELATION OF PNEUMONIA TO INFLUENZA IN BOSTON.

F. C. SHATTUCK (*New York Med. Journ.*, June 14, 1890) makes a statistical study of pneumonia and influenza in Boston, and of the relation existing between them. This he bases upon the cases occurring in the two larger hospitals of the city, upon the city death-returns of bronchitis and pneumonia, and upon the records of the cases of pneumonia and influenza as witnessed among the employes of the Pacific Mills of Lawrence. Of 4242 employes of these mills 1699 were severely enough affected by influenza to be kept from work for several days, and 8 of these had pneumonia, with 2 fatal results.

The author draws the following conclusions from his observations, which he admits, do not throw much light on the nature of influenza-pneumonia.

1. Pneumonia was unusually prevalent in Boston during the height of the influenza epidemic, about the middle third of the visitation.

2. The statistics of the Pacific Mills indicate that less than one-half per cent. of those severely attacked by influenza acquired pneumonia.

3. Broncho-pneumonia was rare in the hospitals.

4. The pneumonia mortality-rate was probably not increased, perhaps diminished, as compared with that of the previous five years.

5. The number of cases of pneumonia not preceded by grippe symptoms was about the same as the number of pneumonias in an average year.

6. Pneumonia followed grippe in so large a number of cases as to show some sort of connection between the affections.

7. In 60 per cent. of the cases a single lobe only was affected.

8. Two-thirds of the cases terminated by lysis.

9. Pneumonia was three times as frequent in males as in females, and the mortality-rate increased with each decade.

10. The most striking increase in the urban deaths from pneumonia was, on the whole, between the ages of twenty and sixty, and eighty and ninety. The increase under ten was slight.

11. The gross appearances in nine cases examined after death were not specially noteworthy.

FRIEDREICH'S ATAXIA.

DEJERINE and LETULLE (*La Médecine Moderne*, 1890, No. 17, 321) make a critical study of the pathology and pathological anatomy of Friedreich's ataxia; basing it upon a case recently reported by Letulle and Vaguez before the *Société de Biologie*, and upon a review of the reported autopsies in this disease, though they omit some very important cases, apparently without good reason. This case, whose clinical history had already been partially reported by Blocq two years ago, they sum up as follows:

Friedreich's disease in a young man, only son of a family entirely free from any hereditary taint. Motor incoordination commenced ten years before. An ascending progress of ataxiform affection of contractibility. When at

rest an athetotic condition of the four extremities and of certain muscles of the face. Arrhythmic oscillations of the head; nystagmus; slow and scanning speech; Romberg's symptom; loss of all the tendon-reflexes. Perfect integrity of sensibility in all its forms; integrity of all the sensory apparatus; absence of trophic affection. Normal electrical reactions. Arrest of the general development of the body, especially in the lower limbs; infantile expression; habitual genital excitement; a slight degree of intelligence. Scoliosis; abnormal prominence of the dorsal region of the foot. Asystole, pulmonary apoplexy, death at the age of twenty-one years.

Autopsy: Narrowing of the mitral orifice, probably congenital; pulmonary apoplexy. The spinal cord small; the meninges adherent on the posterior surface; extreme sclerosis of the columns of Goll; very marked sclerosis of the columns of Burdach; atrophic lesions of considerable degree in the columns of Clarke; disseminated atrophy of the posterior roots much less than the sclerosis of the posterior columns; the same sclerotic lesions of the zone of Lissauer; slight and restricted sclerosis of the crossed pyramidal tracts; atrophic lesions of moderate intensity of the direct cerebellar tracts; perpendymal glioma with lateral displacement of the ependymal canal; thickening of the posterior spinal meninges; absolute integrity of all the anterior portion of the cord.

In discussing the pathology of the disease, the authors first call attention to the appearance of the posterior columns in their case, so entirely different from that seen in the disease of Duchenne. In the latter there is a considerable thickening of the trabeculæ leaving the pia mater; thickening of the neuroglial tissue between the nerve-tubules, and alteration of the vessels and the peri-vascular connective tissue. Nothing of this sort was to be found in the posterior columns of the authors' patient; but, instead, a *pure, neuroglial sclerosis*, independent of all vascular degeneration, entirely analogous to that described by Chaslin as occurring in the brain in patients afflicted with essential epilepsy. Instead of the thickening there were whirls of very fine and very long fibres, pressed one against the other, and arranged on different planes, but chiefly horizontally. In the antero-external zone of the columns of Burdach some nerve-tubes could be found; and these, instead of being seen cut transversely, followed the direction of the whirls in which they were situated. This peculiarity of Friedreich's ataxia is one which the authors claim has not before been described, and one which is always absent in ordinary tabes. The further description of the histological changes in the posterior columns they give with the fullest detail. As regards the lateral tracts, they make the claim that in the reported cases the sclerosis here decreases from the periphery toward the centre of the cord, and from below upward. It is thus very different from a true systemic lateral sclerosis; for while in the lower portion of the cord it occupies the direct cerebellar and the crossed pyramidal tracts, in the cervical region only a portion of the former is involved, and the lateral tracts are free. The sclerosis in the postero-lateral portion of the cord was very different from that of the posterior columns; there being an absence of the whirls described, but the presence of a marked thickening of the trabeculæ of the pia mater with alteration of the vessels. The authors believe that Friedreich's ataxia is a non-systemic, combined sclerosis; a systemic sclerosis of the posterior columns, complicated by a lateral

sclerosis, dependent upon a cortical meningo-myelitis. They review the publications of Friedreich, Smith, Pitt, and Rüttimeyer, to show that these writers had in fact observed the same appearance in the posterior columns as now described, but had failed to recognize its significance. They state that there are but two forms of sclerosis in the spinal cord: the one, the sclerosis with vascular alterations; the other, the pure, non-vascular, neuroglial sclerosis. Disseminated sclerosis, tabes, and diffuse sclerosis belong to the first class, while Friedreich's ataxia is the only member of the second class yet known. This neuroglial sclerosis of the posterior columns they denominate also a "gliosis." It is a sclerosis derived from the external layer of the blastoderm since the neuroglia is derived from this. This new view of the disease is important, both pathologically and etiologically. With this conception we can understand better the great influence of heredity and the family character of the disease, its *début* in infancy or adolescence, the smallness of the posterior part of the cord, and the frequent coincidence of anomalies of the central spinal canal. The purely neuroglial nature of the lesion makes it evident that we have to do with an anomaly in development of the spinal cord, particularly of the posterior portion.

A CASE OF CEPHALIC TETANUS, WITH FACIAL PARALYSIS.

LANNOIS (*Rev. de Méd.*, 1890, 168) reports a case of this affection occurring in a man of sixty-nine years, whose previous history could not be clearly elicited, but who appeared to have been gradually growing more and more weak, while his legs became swollen and his breath short. Fifteen days before coming under observation he took to his bed on account of inability to walk from weakness and from the swelling of his legs. For eight days his wife had noticed that he could not open his mouth, and she had been obliged to feed him with liquid food, which he drew in between his teeth. The most striking feature, on the inspection of the patient, was a peripheral paralysis of the left side of the face. There was a small wound on the face near the external angle of the left eye. It was impossible to learn how long this had existed. It was covered by a sero-purulent fluid, possessed a hard base, and was surrounded by an œdematous area. Both pupils were greatly contracted. Trismus was present, with firm contraction of the masseters on both sides, rendering it impossible for the patient to open his mouth, or to move the lower jaw from side to side, and rendering speech difficult. There was no hydrophobia or dysphagia.

His condition grew somewhat worse; there appeared to be times in which the contracture was increased; some muttering delirium appeared; stiffness of the back of the neck developed, and there once seemed to be difficulty in swallowing. In about two days he died. The post-mortem examination revealed nothing of importance. A bacteriological examination was made without results.

In reviewing the case, the author says that this patient presented the essential phenomena of cephalic tetanus, namely: 1. A wound in the region of the trigeminal nerve; 2. A complete facial paralysis of peripheral type, situated on the same side as the lesion; 3. Tetanic spasm limited to the elevators of the jaw, then extending to the muscles of the neck, and, perhaps,

to those of the pharynx. In addition to these features, there was in this case the great contraction of the pupils; a symptom which, when present, would seem to indicate that the nucleus of the third pair, which presides over the movements of the iris, was implicated as well as the motor nucleus of the trigeminal.

Villar found that the average period of incubation in the twenty-eight cases which he analyzed equalled nine days. In this case it was impossible to determine this point. The total duration in this instance was ten or eleven days.

As regards the explanation of the paradoxical combination of paralysis with tetanic symptoms, no post-mortem lesions have been discovered in any case which can explain the matter. The least improbable of hypotheses is that tetanus is an infectious malady, and that the soluble products of the bacillus, the toxins, act upon the nerve-centres. It may be that the same substance acts differently upon different nerves, producing here spasm and there paralysis. Or it is possible that the bacillus produces more than one alkaloid; one of which produces spasm, and another paralysis.

ON INTESTINAL ANTISEPSIS.

CANTANI (*Wien. med. Woch.*, 1890, No. 21, 851) says that there are two ways to render innocuous the living germs of disease in the intestine—*i. e.*, either *per os* or *per anum*. For use in the first method only such substances can be employed which will pass the stomach unchanged. Calomel has been shown to be useful in this way in the case of simple fermentative processes, but useless in cases of longer infection. Charcoal, naphthalin, salicylate of bismuth, and iodoform, have also been employed. These substances exert an antiseptic influence on the intestinal contents, it is true, but, on account of their insolubility, are unable to influence the intestinal wall itself; and experience shows that they possess no power over the course of typhoid fever. It is clear that the administration by the mouth of soluble disinfectants, capable of being absorbed in the intestine, or of undergoing decomposition there—as carbolic acid, sublimate, etc.—can never fulfil the purpose of a thorough intestinal antiseptis; for, apart from the fact of the smallness of the dose which the human economy will tolerate, the greater part of the substance is absorbed in the stomach, and the remainder reaches the intestine in so altered a condition that its antiseptic power is more or less lost.

Through the anus is, therefore, the only, as it is the best, way left us to bring antiseptic substances directly into contact with the germs of disease. That large injections will pass the ileo-cæcal valve, has been repeatedly proven by experiments. The advantages of this method are: that the mechanical irritation produced by any powder is done away with, that the stomach is spared all mechanical or chemical action, that there is a more direct contact of the drug with the diseased portion of the intestine, and that greater doses of a saturated solution may be employed than can be introduced through the stomach. The method possesses secondary actions not to be undervalued. Thus, the bodily temperature can be reduced by the use of cold injections, or raised by hot fluids, or the intestine may be washed out and large amounts of bacteria and ptomaines removed.

Of substances to be employed for intestinal antiseptics, those most to be preferred are tannic acid and carbolic acid. Sublimate has no disinfecting action, on account of the combinations which it forms with albumen in the bowel. Tannic acid fulfils the double indication of a rational intestinal antiseptics, namely, paralyzing the vegetative activity of the bacteria, and the rendering innocuous the poisonous ptomaines formed there. Experiments have shown this, and actual clinical experience amply confirms it. There is nothing better than tannic acid enteroclysis in all forms of intestinal catarrh produced by bacteria, and accompanied by fermentation. The addition of gum Arabic is desirable in dysentery when the bowel is irritated. In case of great tenderness an injection of one to one and a half quarts of oil is of advantage, occasionally alternated with enemata of tannic acid. In typhoid fever enteroclysis is a valuable method; the meteorism and diarrhœa rapidly diminishing, and the disease running a favorable course. In the very earliest stages of the disease it even seems possible to exercise an abortive action upon the commencing typhoid infection in the intestine.

ON THE AMŒBA COLI IN DYSENTERY AND IN DYSENTERIC LIVER ABSCESS.

OSLER (*Johns Hopkins Hosp. Bull.*, May, 1890) reviews the literature relating to the discovery of and investigations concerning the *Amœba coli*. The most extended observations have been made by Kartulis, who found these organisms in every instance in the stools of 500 cases of dysentery, while in 12 autopsies the amœbæ were present in every case. He extended his observations, too, to liver abscess due to dysentery, finding the parasite in every case which he examined. Massiutin has also made studies upon the organisms, finding them identical with those described by Kartulis, though not agreeing entirely with him regarding their etiological connection with the disease.

Osler reports the case of a man who had had several attacks of chronic dysentery, and finally developed an abscess of the liver. The abscess was opened, and the amœbæ found in the pus in large numbers up to the date of the patient's death, as well as in the stools. The amœbæ from the liver ranged from 10 μ to 20 μ in diameter. They were circular or ovoid when at rest, but when in motion presented the extremely irregular contour of moving amœboid bodies. The protoplasm could be distinctly differentiated into a translucent homogeneous ectosarc, and a granular endosarc containing the nucleus, granules, and vacuoles. The processes seen during movement were always rounded, never angular or linear as in the white blood-corpuscles. Though the movements were sometimes slight, many examples were seen in which they were quite as striking as in the large active forms of pond amœbæ.

The character of the stools varied considerably. Sometimes there was a large, fluid, brownish evacuation, with little or no mucus, but more often three or four ounces were passed at a time, and blood and small whitish sloughs were seen scattered through this. Sometimes the stools were composed chiefly of mucus. Experience showed that the amœbæ were rarely found in the brownish stools. In the mucus they were more frequent, but

they were met with in large numbers only in the small, grayish fragments, which were, no doubt, portions of sloughs. The general character of the amœbæ was identical with that of those of the liver, except that a greater variation in size was noticed.

SALINE INTRAVENOUS INJECTIONS IN DIABETIC COMA.

DICKINSON (quoted in *Practitioner*, April, 1890, 292) reports the case of a woman, aged twenty-five, suffering from diabetic coma, who was treated by the intravenous injection of a solution of chloride of sodium, chloride of potassium, sulphate of sodium, and bicarbonate of sodium dissolved in water. This was slowly injected into the arms until, in the course of an hour and a half, 106 ounces had been introduced. There was no immediate improvement, nor did the patient seem any worse. About ten minutes after the conclusion of the operation consciousness began to return, and soon became so complete that she was able to talk with her friends and take food; but the next day she was again as comatose as before. The injection was repeated into one of the veins of the leg, and 350 ounces were introduced. The patient remained unconscious for about three-quarters of an hour, then recovered complete consciousness, and retained it for nine hours. After this she was drowsy, but for the most part sensible for thirty hours; then lapsed into coma and died. Urine of a specific gravity of 1012, containing 1.8 per cent. sugar, was freely voided; it gave no acetone reaction, though this had been well marked before the injection. The bowels were loose. The skin, which had been dry, became moist.

The author thought that the delay in the return of consciousness indicated that the benefit was due to elimination rather than to hydration. It is clear that 100 ounces, or twice that quantity, can be introduced with advantage, but the results were not such as to promise more than temporary benefit. As a practical and safe conclusion is the suggestion that the free drinking of water should be enforced before diabetic coma is established in cases in which it is anticipated.

SURGERY.

UNDER THE CHARGE OF

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RESECTION OF THE CECUM FOR CARCINOMA.

Some general observations upon the question of resection of the caecum for malignant disease, together with the report of two cases in which the operation was performed, are contributed by SENN (*Journal of the American Medical Association*, June 14, 1890).

He announces the following conclusions:

1. Resection of the cæcum for carcinoma can be done with a fair prospect of a permanent cure if the operation is performed before infiltration of the retro-peritoneal and mesenteric glands has occurred.

2. Ileo-colostomy with absorbable perforated approximation-plates is the best method of restoring the continuity of the intestinal canal after excision of the cæcum.

3. The best material for approximation-plates is decalcified bone preserved in an antiseptic solution.

4. Hygroscopic and indestructible or inabsorbable material should not be used in the preparation of approximation-plates or rings, as the former may cause pressure-gangrene, and the latter may prove a source of danger by remaining permanently as a foreign body in the organ in which it has been introduced.

5. Ileo-colostomy without resection of the cæcum is indicated in cases of intestinal obstruction from inoperable carcinoma of the cæcum, irreducible invagination without perforation or evidences of gangrene, and in cicatricial stenosis in the ileo-cæcal region not amenable to a plastic operation.

6. Scarification of the serous surfaces interposed between the bone-plates is the most reliable means of hastening the formation of adhesions and of shortening the process of definitive healing.

7. Resection of the cæcum and ileo-colostomy with or without enterectomy should be done through a lateral incision, extending from near the middle of Poupart's ligament to a point half-way between the anterior superior spinous process of the ilium and the umbilicus.

8. Suturing of the serous surfaces just beyond the margins of the bone-plates renders material aid in maintaining apposition between the serous surfaces which it is intended to unite, and furnishes an additional safeguard against fecal extravasation.

9. Anchoring of the approximated parts in the ileo-cæcal region with a mesenteric-peritoneal suture should be done in ileo-colostomy after resection of the cæcum.

SURGICAL TREATMENT OF GENERAL PARALYSIS.

SHAW and CRIPPS (*British Medical Journal*, June 14, 1890) report a case of general paralysis of the insane in which decided amelioration of symptoms followed trephining. The patient was admitted into the Banstead Asylum in April, 1889, with well-marked symptoms of general paralysis. There was a history of a blow on the left side of the head inflicted fifteen months before. He complained of great pain in the region of this injury. The symptoms were typical and complete. The patient was trephined over the seat of injury with the object of relieving pain, of draining off fluid, and of lessening pressure. The trephine was applied just in front of the left parietal eminence. The bone was found to be moderately thin; a second disk was removed an inch posterior to the former and the intervening bone was taken away. There was much bulging of the dura mater. A portion of the dura, arachnoid, and pia mater, somewhat less in area than the bone-opening, was dissected out. The scalp-flap was then replaced, the wound

was drained and closed. The drainage-tubes were removed the following day.

Cephalalgia disappeared entirely, and the memory was much improved. Beyond a certain sense of well-being there was no appearance of delusion. Motor symptoms were not influenced. He was discharged four months after operation, there being no mental disease beyond a slight dulness. A month later the patient's condition was about the same as when he was discharged from the hospital. He had procured a situation, but was unable to keep it, and exhibited some irritability of temper.

Cripps also reports the sequel of the first case operated on by him in July, 1889. The mental symptoms were entirely relieved, and the patient was discharged from the workhouse because it was impossible to keep him under certificate. In February of this year, he had a severe attack of convulsions, and, after lying in a comatose state for some time, died six months after operation. In his last convulsive attack, though there was a little pulsation, no bulging was noticed over the trephine-hole. This negatived the idea of obtaining relief from opening of the scar. On post-mortem examination, the absence of bulging was accounted for by the fact that a very tense fibrous membrane had taken the place of the removed bone. About six ounces of fluid were taken from the brain. Cripps believes that, even if cure cannot be obtained by relieving cerebral pressure, great relief follows.

The cases are as yet too few in number to judge of the risk of operation. The other patient upon whom he operated, recovered sufficiently to have made a will which would have stood in a court of law.

It is possible that better results may be obtained by removing a much larger area both of the bone and meninges than has hitherto been done.

INTUSSUSCEPTION TREATED BY THE AID OF BARNES'S BAG.

RIVINGTON (*The Lancet*, June 7, 1890) reports two cases of intussusception treated by means of Barnes's bag.

The first case was a man of fifty-seven, suffering from a chronic form of obstruction with acute exacerbations. During the latter the gut protruded externally for two inches. On admission to the hospital, a rectal examination showed a rounded, firm swelling, about the size of a hen's egg, with a velvety surface. At its apex was an orifice into which the finger could easily be passed. There was no abdominal tumor. A Barnes's bag was introduced into the rectum empty, and was gradually filled with fluid. The intussusception slowly receded, and finally disappeared altogether; the patient suffered from no further signs of his trouble.

The second case was a child seven months old. He had been suffering with abdominal symptoms for two weeks, crying with pain, vomiting, and passing blood from the bowel. The intestine was protruding externally. An injection of two pints of water reduced the intussusception; but the following morning the bowel again came down. The ileo-cæcal valve formed the apex of the invaginated portion of the bowel. Reduction of the intussusception was easy as far as the upper part of the rectum, but attempts to reduce it further by injection, insufflation, and position failed. A characteristic tumor was found in the position of the descending colon and sigmoid

flexure. The bowel constantly descended, in spite of the strapping of the buttocks together. Finally, it was reduced as far as possible and retained in position by the introduction of a Barnes's bag, which was then inflated with air; this bag was removed twice a day to allow the escape of liquid motions. On the second day the bag was retained twenty-four hours. At the end of that time the tumor had disappeared, and, on taking away the bag, a large quantity of flatus escaped. No further symptoms attributable to the intussusception were afterward noted, although the child steadily emaciated, and finally died three weeks later.

Rivington explains the action of the bag in this case by stating that reduction was due to peristaltic or anti-peristaltic action of the bowel which contained the intussusceptum. Another possible explanation is, that reduction might be due to the accumulation of gas above the bag.

This method of treating intussusception is, of course, not serviceable in cases of acute strangulation, or where adhesions are formed.

RESECTION OF THE TRANSVERSE PROCESS OF THE SEVENTH CERVICAL VERTEBRA.

A case involving great surgical skill and particularly successful in its outcome is reported by PERRIER.

A man, aged thirty, had suffered from palsy for many years, with violent pains in his right arm associated with muscular atrophy. On examination, a bony outgrowth over the transverse process of the seventh cervical vertebra was discovered. The patient noted this in his twelfth year. The symptoms were due to the pressure of this exostosis upon the subclavian artery and the brachial plexus. An incision was made in the right subclavicular fossa, and the external jugular vein was ligated. The subclavian artery and vein, together with the brachial plexus, were drawn aside, and the bony growth was fully exposed. In removing this the pleura was wounded. This was followed by pneumothorax and cellular emphysema. Both disappeared in a few days. The wound healed, with drainage, by primary intention.

The subsequent treatment consisted in the use of douches, massage, and electricity. Pain and muscular atrophy entirely disappeared, together with a slight hoarseness which had been observed before the operation. The patient's recovery was complete.

STERILIZATION OF CATGUT.

This most important subject has been ably investigated by LAROCLETTE (*Lyon Medical*, June 1, 1890).

According to Reverdin, sterilization of catgut is more difficult to accomplish than is the case with any of the other materials used for suturing or ligature. He states that it is comparatively easy to destroy all the germs in catgut if the latter is entirely free from fat, and is then submitted to a temperature of 140° C. for four hours. When the fat is not removed from the gut, the latter is fried in its own grease. For the purpose of determining the accuracy of this observation, Larochette introduced pieces of catgut into glass tubes, which were then hermetically sealed. These tubes were placed in an oil-bath, the temperature of which was gradually elevated. At 99° C.

the smallest catgut was so markedly altered as to be unfit for use. At 106° C. the largest size was similarly affected. For the purpose of entirely removing all fat, a quantity of catgut was then subjected to the action of ether and bisulphide of carbon. Precisely the same results followed as in the first series of experiments. Catgut deprived of its fat was then placed in a large oven, which was gradually heated. At a temperature of 100° C. it suffered no change. It was then kept for three hours at a temperature of 145° C. On removing it from the oven it was found to be slightly burned, but was still sufficiently strong to use in surgical practice. Those strands, however, which had been freed from fat by the action of ether were entirely useless, being rendered almost friable. Dynamometer tests applied to the catgut thus sterilized by heat showed that its resistance was but slightly lessened. This was particularly the case when the fat had not been removed. The strands were much less supple than before being sterilized by heat. Larochette considers that the sterilization of catgut by heat is perfectly practicable if the following points are carefully observed—namely, the gradual elevation of the temperature, and plenty of space for the evaporation of the water contained in the gut. After exposure for two hours to a temperature of 140° C. (284° F.) sterilization is complete. The catgut should then be placed, by means of a pair of flamed forceps, in olive oil previously boiled, and containing 10 per cent. by weight of crystallized carbolic acid.

STRICTURE OF THE ŒSOPHAGUS.

INGALS (*Medical Record*, July 5, 1890) finds that the disease occurs more frequently in males than in females, and is usually met with in early life. It is occasionally found in childhood, and congenital cases have been observed. The strictures resulting from swallowing caustic fluids are found usually at the upper part of the tube, just back of the cricoid cartilage. The seat next most frequently involved is the lower portion of the tube, near the cardiac orifice of the stomach. Occasionally multiple strictures are encountered.

When a stricture has existed for some time, that part of the œsophagus above is apt to become dilated on account of the detention of food and fatty degeneration of the muscular walls; and in very close strictures, the portion beneath becomes atrophied.

The disease is usually traumatic when seen in persons in early life, and malignant when found in those past fifty years of age. The traumatic cases almost invariably result from the swallowing of hot or acrid substances, either accidentally or with suicidal intent. In some instances the disease apparently arises spontaneously, although it seems probable that the number of these cases is overestimated, on account of the patient either having forgotten or overlooked the real cause. Syphilis, tuberculosis, and more rarely rheumatism may act as causal factors.

In the cases of malignant origin, dysphonia and dysphagia are apt to be present at some time in the disease. Occasionally paralysis of the vocal cords, due to pressure on the recurrent laryngeal nerve, is seen.

In the diagnosis the use of the laryngoscope is important, as it enables the physician to exclude diseases of the pharynx. Auscultation during the deglutition of fluids is also useful—a gurgling sound may be heard at the

seat of the stricture. Occasionally the stricture may be detected by palpation over the œsophagus, but the most satisfactory evidence is furnished by passing an œsophageal bougie. Great care must be exercised, however, in the use of this instrument, in cases in which there is a possibility of malignant disease, or of ulceration of the œsophagus, otherwise the tube may be torn. Tumors and tuberculous laryngitis are to be excluded, the former by a careful examination, the latter by the constitutional symptoms, pulmonary signs, and laryngoscopic examination. It is also to be noted that the pain during deglutition is very much greater in tuberculous laryngitis. It must be remembered in the case of spasmodic strictures that there are intervals when all of the symptoms of the trouble may be wanting.

The malignant form of the disease is usually fatal in from eight to eighteen months. The non-malignant strictures frequently pursue a very slow course, but in the cases due to traumatism a cure is usually impossible, and if the case be one in which there is marked contraction, followed by dilatation above the seat of the trouble, death may result from ulceration, abscess, or gangrene, as well as from marasmus.

In those cases in which the constriction is very moderate, the spasmodic cases, and those due to catarrhal inflammation, the prognosis is favorable. Obviously a very important part of the treatment of any form of this disease is the administration of sufficient and suitable nourishment, and when this cannot pass the stricture nutritive enemata should be employed.

In the specific and rheumatic cases the iodides are to be given; in those of malignant origin arsenic may be prescribed for its supposed specific effects, and opium in sufficient quantities to relieve the pain; in all other cases by far the most useful treatment is mechanical dilatation. This may be employed occasionally in malignant cases with benefit. For this purpose graduated œsophageal bougies are used, either alone or subsequent to internal or external œsophagotomy. Internal œsophagotomy is generally considered a hazardous operation, and has not found favor with surgeons. Dr. J. O. Roe, of Rochester, has reported three cases successfully treated by this method. External œsophagotomy is very rarely called for, only being useful when the stricture occupies a portion of the œsophagus easy of access. Experience has shown that in the malignant cases the average duration of life is only one month after external œsophagotomy or gastrotomy.

In using the bougies, a medium size should first be selected to locate the stricture, after which smaller sizes are to be tried until one which passes through the stricture is found, when larger sizes can be employed. Dilatation should be repeated after three or four days, beginning with the next to the largest bougie used at the last sitting, and following by two larger sizes. As the stricture yields to the treatment the sittings may become less and less frequent.

Electrolysis has also been employed in the treatment of this affection. It is considered by some as dangerous on account of the proximity of the pneumogastric nerve. Fort, of Paris, has used this method in the treatment in 19 cases; 8 of these were of the fibrous variety, and after a period varying from nine to thirty days, 7 were so far cured that 18 to 20-millimetre bougies could be passed. The remaining 11, though all malignant, were much benefited.

The essayist reports thirteen cases which he treated according to the methods above detailed.

PNEUMOTOMY FOR GANGRENE AND ABSCESS.

RAMSAY (*Annals of Surgery*, vol. ii.) reports four cases of pneumotomy. In three abscess-formation constituted the reason for the use of the knife; in the fourth operation was undertaken for gangrene, which ended in death; the other three terminated in recovery. In the case of gangrene upward of an inch of the seventh rib was resected, the seat of sloughing was found by means of an exploring-needle, the lung was incised and the gangrenous area was thoroughly drained. Adhesions between the parietal and visceral pleura prevented pneumothorax. The patient made a good recovery. A three-per-cent. carbolic lotion was at first used as an injection. This caused such a violent spasmodic cough that it had to be discontinued.

In the second case pulmonary abscess developed in consequence of a gunshot wound. Pneumothorax was also present. Portions of the third, fourth, fifth, sixth, and seventh ribs were resected and the lung abscess was incised at the level of the the third rib. The patient recovered entirely.

In the third case portions of several of the ribs were resected. The abscess was opened by means of a Paquelin cauterizer and packed with iodoform-gauze.

There were, however, multiple abscesses in the lung, and the patient perished some months later from septicæmia.

The fourth case was treated in a similar way and terminated in recovery.

OBSTETRICS.

UNDER THE CHARGE OF

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THE RESULTS OF OPERATIVE OBSTETRICS.

DÜHRSEN (*Berliner klinische Wochenschrift*, Nos. 23 and 24, 1890) concludes, from the results of 230 cases of obstetric operations, that the mortality in confinement is not increased by operation. His cases occurred mostly in polyclinic practice, and he regards Cæsarean section as the only operation which adds to the risk of septic infection. He employs strict anti-sepsis of operator and instruments; uses carbolic acid, 3 per cent., as intra-uterine douche; tampons the uterus and vagina for hæmorrhage; performs version in flat pelvis; incises the cervix and labia when the parts are rigid; pushes the head down into the pelvis by supra-pubic pressure before applying the forceps, and applies it often obliquely. In abortion he empties the uterus at once by

the finger or curette; in adherent placenta complete narcosis is considered indispensable in emptying the uterus. With these principles of treatment 230 operations were performed, with 3 deaths from sepsis, 1 from eclampsia. Morbidity and results in children were correspondingly good.

DYSTOCIA FROM IMPACTED OVARIAN CYST.

LOMER (*Deutsche medicinische Wochenschrift*, No. 24, 1890) reports the case of a multipara with contracted pelvis; the child perished from prolapse of the cord; efforts at forcible extraction resulted in severing the trunk from the head; the patient died, collapsed. On examination an ovarian cyst was found imbedded and adherent in Douglas's cul-de-sac. Lomer, from cases observed by him and from recorded cases, urges, 1, examination *per rectum*; 2, endeavor to dislocate and replace the tumor, with puncture through the rectum; free incision through the rectum and emptying the cyst may be needed.

CERVICAL MYOMA OBSTRUCTING LABOR; CÆSAREAN SECTION AND ENUCLEATION OF TUMOR; RECOVERY.

ENERKE (*Deutsche medicinische Wochenschrift*, No. 29, 1890) reports the case of a multipara whose labor was obstructed by a cervical myoma. Efforts to dislocate the tumor and deliver the head with forceps or to enucleate the tumor through the vagina failing, Cæsarean section was performed, and the uterus and abdomen closed as usual. An incision was made into the tumor through the vagina, and it was enucleated and its capsule packed with iodo-form-gauze. Mother and child recovered.

[It is not necessary to amputate the uterus in myomata of the cervix, but in myomata of the body of the uterus amputation should be performed, because necrosis of the incised myoma and sepsis result if Cæsarean section be done.]

AMPUTATION OF THE GRAVID UTERUS FOR MULTIPLE MYOMATA; RECOVERY.

DONAT (*Centralblatt für Gynäkologie*, No. 29, 1890) reports a case of multiple myomata which prevented dilatation of the uterus and the completion of labor. Uterine amputation was performed, the stump covered by peritoneum and replaced in the abdomen; a glass drainage-tube was placed in Douglas's cul-de-sac. Uncomplicated recovery followed.

In discussing this case SÄNGER emphasized the necessity for drainage when the stump is dropped into the abdominal cavity.

THREE CASES OF ECTOPIC GESTATION.

SÄNGER (*Ibid.*) reports an ovarian-abdominal pregnancy in which the amnion was found infiltrated with calcareous material; the fœtus lay free in the abdominal cavity, and the placenta was contained in a sac formed by the left tube and ovary. Microscopic examination revealed necrotic placental tissue, but no trace of ovarian. The conclusion was reached that the pregnancy had been ovarian-abdominal.

Also a case of tubal gestation at three months, with intra-ligamentous rupture and extra-peritoneal hæmatocele. The incision was T-shaped, extending along the linea alba and at right angles. The peritoneum and sac were sutured and ten days allowed to elapse before the sac was opened with the thermo-cautery. The sac and other pockets were tamponed with iodoform-gauze; no other drainage was employed. Recovery followed.

A third case of tubal abortion, with ovarian hæmatoma and hæmatosalpinx was also successfully treated by laparotomy.

ONE HUNDRED AND EIGHTEEN CASES OF INDUCED LABOR.

AHLFELD (*Centralblatt für Gynäkologie*, No. 30, 1890) has induced labor in 118 cases, from whose study he draws the following conclusions: The results of the induction of labor compare most favorably with those of Cæsarean section—80 per cent. of 111 cases leaving the hospital in good health. In 101 children born in contracted pelvis, 60 $\frac{39}{100}$ per cent. were discharged in good health. The method of introducing a bougie is best adapted to private and hospital practice. Labor should be induced as late as possible; and the smallest true conjugate which justifies the operation is two and three-quarters inches. Induced labor should be allowed to proceed as nearly like normal labor as possible.

OVARIAN CYST COMPLICATING PREGNANCY; RUPTURE OF THE CYST; RECOVERY.

RUGE (*Ibid.*) was called to a patient four months pregnant, who suffered greatly from the pressure of a pelvic cyst. Under anæsthesia the tumor was outlined and replaced; abortion followed. After recovery laparotomy was performed, when no cyst was found. It had probably ruptured during reposition, being most likely a broad-ligament cyst.

HYPODERMIC TRANSFUSION OF DILUTE SALINE FLUID FOR PROFOUND ANÆMIA.

HUZARSKI (*Centralblatt für Gynäkologie*, No. 28, 1890) reports a case of obstinate *post-partum* hæmorrhage in which the greatest benefit was derived from rectal injection of two pints of salt solution $\frac{1}{10}$ of 1 per cent.: in a recurrence of the hæmorrhage one and a half pints of the solution, warmed, were injected beneath the skin between the shoulders. Recovery resulted.

A CASE OF INVERSION OF THE UTERUS.

BARSONY (*Centralblatt für Gynäkologie*, No. 28, 1890) reports a case in which complete uterine inversion occurred four months before the patient came under observation, produced by rapid delivery of the placenta at the hands of a midwife. After pressure with a colpeurynter had been employed for several days without result, examination in the knee-chest position revealed the fact that the uterus was not in the pelvic axis, and that force was misdirected and lost against the vaginal portion. The vagina and parts about

the uterus were then tamponed with iodoform-gauze sufficiently to keep the uterus in place and pressure was renewed, when reposition occurred after a few hours.

PREGNANCY INTERRUPTED BY EXOPHTHALMIC GOITRE.

HABERLIN (*Centralblatt für Gynäkologie*, No. 26, 1890) observed the interruption of pregnancy at eight months by death of the fœtus, which resulted from premature separation of the placenta followed by the development of exophthalmic goitre. Hæmorrhage was controlled by antiseptic tampons and the uterus was emptied spontaneously. Normal puerperium and cessation of the symptoms of goitre followed.

AN ELECTRIC BREAST-CUP TO PROVOKE LABOR-PAINS.

Taking advantage of the familiar fact that irritation of the breasts often causes the uterus to contract, FREUND (*Ibid.*) has devised an electric cup shaped like an ordinary dry-cup, containing a moistened sponge which he applies over the mammary gland; the cup carried the kathode of a galvanic circuit. The anode was a broad plate placed over the abdomen. Six or seven milliampères sufficed to excite vigorous and persistent uterine contraction. The sponge in the cup was brought in contact with the nipple. The apparatus gave good results in two labor cases, and worked well in several pregnant patients.

THE TREATMENT OF PLACENTA PRÆVIA.

WYDER (*Correspondenz-blatt für Schweizer Aerzte*, No. 14, 1890) takes issue with the treatment of placenta prævia by the tampon for the following reasons: Hæmorrhage from the uterine sinuses is not certainly checked by the tampon, when the membranes have ruptured there is great danger of intra-uterine hæmorrhage persisting; version and immediate extraction, advocated after the use of the tampon, expose the patient to the dangers of septic infection and injury to the lower uterine segment and cervix; by this method of treatment hæmorrhage in the third stage of labor and artificial separation and delivery of the placenta are more frequent; in the use of the tampon much valuable time is lost. Wyder believes that combined version, tamponing the uterus with the breech and body of the fœtus, and spontaneous and slow expulsion of the fœtus, reduce the dangers of placenta prævia to a minimum for mother and child.

INDUCED LABOR IN HUNGARY.

DIENER (*Wiener medicinische Presse*, No. 28, 1890) reports a case of induced labor for a flat rachitic pelvis whose true conjugate was $3\frac{1}{6}$ inches; previous labors had been difficult. Bougies were introduced for five days, the uterus acting slowly, and delivery was effected by version. Mother and child recovered well.

The induction of labor has been performed in Hungary twenty-three times, Semmelweis having first done it in 1856. Its rarity is explained by the fact that pelvic deformity is uncommon in Hungary.

THE ETIOLOGY AND TREATMENT OF OSTEOMALACIA.

SCHAUTA (*Wiener medicinische Presse*, No. 27, 1890) has collected twenty-four cases of osteomalacia treated by uterine amputation, of whom twenty were cured and four improved. Eight cases have been treated by oöphorectomy, among them Schauta's last case, in which marked improvement followed removal of the tubes and ovaries one and a quarter years after the fourth confinement. VON JAKSCH examined repeatedly the urine of two patients operated on by Schauta. He found a great excess of fatty-acid compounds; uric acid, nitrates, phosphoric acid, lime and magnesia were very deficient. The alkalinity of the blood was also greatly lessened. He had not found albumose. In rhachitis these conditions were not present.

PARTIAL NECROSIS OF THE UTERUS AND VAGINA.

DOBBERT (*St. Petersburger medicinische Wochenschrift*, No. 23, 1890) reports two cases of puerperal septic infection in which partial necrosis and discharge of fragments of uterine and vaginal tissue occurred. One patient recovered, the other died. On post-mortem examination the pathological appearances of gangrene were present. Dobbert narrates, in illustration, a case of typhoid in a multipara, some years after childbirth, in which similar necrosis occurred.

A STUDY OF THE CONFIGURATION OF THE FŒTAL HEAD AT BIRTH.

RUNGE (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix. Heft 1) concludes, from an extended study of this subject, that the existence of marked asymmetry of the foetal skull in certain dimensions as a result of labor is very doubtful. Weber's view is rational, that the mechanism of labor depends largely on the preëxisting configuration of the skull. The convexity of the anterior parietal bone in occipito-posterior position arises during labor, but disappears so soon that scarcely a millimetre-difference remains. The curvature of the frontal bone is practically unchanged by labor. The overriding of the parietal bones and their depression beneath the adjacent bones are the result of rotation.

THE PATHOLOGY OF THE LIVER IN ECLAMPTIC PATIENTS.

PILLIET (*Gazette Hebdomadaire*, No. 30, 1890) believes, from his study of eclamptic cases, that the most important pathological changes in eclampsia occur in the liver. The first of these is dilatation of the branches of the portal vein forming sinuses and blood-pockets. Then masses of liver cells, in a necrotic condition, are observed, and at the periphery of each mass a dilated bloodvessel. Proliferation of leucocytes is also present in the enlarged blood-spaces.

SULPHATE OF COPPER AS AN OBSTETRIC ANTISEPTIC.

In a recent number of the *Journal de Médecine de Paris* TARNIER reports his experience with sulphate of copper as an antiseptic. In a solution of two and one-half drachms to one quart of water patients complained of its irritating

action, and the hands of nurses were stained and roughened. In one-half this strength Tarnier considers it a reliable antiseptic, less dangerous than bichloride of mercury.

RUPTURE OF THE UTERUS; LAPAROTOMY; RECOVERY.

HÉNARD (*Le Mercredi Médical*, No. 23, 1890) reports a case of contracted pelvis in which rupture of the uterus occurred. After efforts to extract the fœtus through the vagina had failed, laparotomy was performed.

The uterus was found torn from its vaginal attachments and was removed. In the emergency ligatures were dipped in brandy in the lack of a usual antiseptic. The abdomen was closed without drainage, and dressed with cloths wet in brandy. On the following day the usual dressings were applied. The patient had completely recovered in two months afterward.

FRACTURE OF BOTH FEMORA IN BREECH LABOR.

REMY (*Archives de Tocologie*, vol. xvii., No. 6, 1890) reports the case of a primipara whose child presented by the breech, and was spontaneously delivered in breech presentation. Labor was not difficult and the child breathed well. On examination it was found to have double talipes equino-varus, and both femora were fractured at their middle. Pseudo-ankylosis, due to muscular spasm, was observed at each hip. Under simple splints union occurred without deformity, and the hip-joint moved freely. Remy explains the case on the supposition that the thighs were crossed upon the abdomen, instead of being extended, by muscular spasm. The presence of such a spastic condition was proved by the double talipes present. One of the causes of this condition is known to be deficient amniotic fluid.

THE TREATMENT OF BREECH-PRESENTATION WHEN THE LIMBS ARE NOT UNFOLDED.

OLIVIER (*Annales de la Policlinique de Paris*, No. 1, 1890), in discussing the question whether birth by breech-presentation or combined version affords best results for mother and child, reports three cases in which great difficulty was experienced in delivering by the breech. He has found a blunt hook carrying a fillet to be of great service in these cases in decomposing the wedge formed by the breech and limbs, by bringing down a thigh. When the back of the child is anterior he would use the hook and fillet; when posterior he would use the hook and fillet; when posterior he would apply Tarnier's forceps to the trochanteric region of the thighs. In very difficult cases the basiotribe may be applied to the after-coming head. It may be necessary to insert the finger in the rectum to dislodge the fœtus when impacted at the perineum.

ECTOPIC GESTATION.

Among the cases of ectopic gestation recently reported the following possess elements of interest:

At a recent meeting of the Obstetrical Society of London STEVENSON reported a case of spurious pregnancy in a multipara, which simulated

ectopic gestation. After the cessation of the usual symptoms of pregnancy there was a swelling as large as the fist to the right of the uterus; the uterine cavity was empty. Diagnosis of ectopic gestation at four months, with rupture into the broad ligament, was made; laparotomy revealed an ovarian cyst, the other pelvic tissues healthy.

ROSTHORN (*Wiener klinische Wochenschrift*, No. 22, 1890) reports the case of a multipara, who was delivered of a dead seven-months' fœtus spontaneously. A tumor remained in the abdomen, and fœtal movements were felt which soon ceased. Laparotomy disclosed a dead fœtus free in the abdomen, having escaped from the left tube. The pregnancy had been twin, and rupture of the ectopic sac had possibly occurred at labor. There are forty-three such cases on record; but one was correctly diagnosed. But five cases of double ectopic gestation are known. The mother made an uncomplicated recovery. JOUBERT reports at Calcutta (*Indian Medical Gazette*, May, 1890) two cases of ruptured tubal gestation which perished from hæmorrhage during operation. In one the placenta was attached to the omentum, and so covered the fœtus that access to it was impossible without tearing through placental tissue. BERNAYS (*American Practitioner*, No. 117, 1890) operated on two cases of recently ruptured and early ectopic gestation. In one the patient was moribund, and the pregnancy was interstitial. Prompt removal of tumor, tube, and cornu saved life, time not being afforded for cleansing the abdomen of blood-clots. Both patients recovered.

REAMY (*Cincinnati Lancet-Clinic*, July 26, 1890) operated on a case of ruptured tubal gestation which had been treated by electricity and opiates. The placenta was adherent to the intestine and pus had formed. Tedious recovery ensued, complicated by fecal fistula, which finally closed.

PREGNANCY AND PHTHISIS; PUERPERAL ECLAMPSIA.

The Transactions of the London Obstetrical Society, vol. xxxii., 1890, contain an interesting paper by DUNCAN, in which he describes a case of pregnancy complicated by phthisis in which he induced abortion, the patient being greatly improved.

HERMAN reports five cases of eclampsia, in which he carefully studied the urine and temperature of the patients. Such differences were observed in the clinical course of the cases, in temperature, urea excreted, and other respects, that the usual course of the disease was scarcely recognizable. Urea seemed excreted abundantly during and after the fits.

THE VALUE OF HYDRASTIN IN UTERINE HÆMORRHAGE.

FALK (*Archiv für Gynäkologie*, Band xxxvii. Heft 2) has treated twenty-eight cases of uterine hæmorrhage from different causes, and in different degrees, by the hypodermic injection of half a syringeful (fifteen minims) of a ten per cent. watery solution of hydrastin. In the 500 injections which were practised, inflammation and suppuration did not occur. Falk believes the drug valuable to check hæmorrhage, but does not consider it of use in promoting labor-pains.

AN UNUSUAL MALPOSITION OF THE FŒTUS DURING LABOR.

EHRENDORFER (*Archiv für Gynäkologie*, Band xxxvii. Heft 2) reports a case of face-presentation in which labor was delayed, and delivery was finally accomplished by an oblique application of the forceps, the child being expelled dead. On examination, the legs were found tightly folded upon the abdomen, the toes extending upon the breast; the arms were flexed backward, the forearms raised upon the scapulæ, the hands upon the shoulders, with the palmar surface directed anteriorly, and the head thrown strongly in extension, the occiput resting between the hands.

A similar case is reported by MURRAY (*Edinburgh Medical Journal*, 1882, p. 890). Ehrendorfer thinks that curvature of the vertebral column as the child descended into the pelvis, was probably the exciting cause of this peculiar position of the fœtus which resulted in dystocia.

HERNIA OF THE GRAVID UTERUS.

SPERLING (*Ibid.*) has observed the case of a multipara having a highly contracted pelvis, upon whom the Cæsarean operation had been performed at a previous labor after the child's head had been severed from the trunk in efforts at delivery. On examination the patient presented a well-marked hernia of the uterus, the womb and its contents falling forward beyond the symphysis pubis between the thighs. Labor was delayed by deficient uterine contraction, and the os uteri was dilated by elastic dilators and tampons of iodoform-gauze. A child, aged 171 days, was born, and survived for twenty hours. It cried lustily, swallowed a teaspoonful of milk, but failed. Post-mortem examination showed imperfect development, with œdema of the brain and pia mater. The case is of interest as showing the influence exerted by an abdominal scar in favoring hernia of the uterus, and also as an example of a child scarcely six months old surviving for a short time, and able to take nourishment.

THE USE OF THE FORCEPS IN BREECH-LABORS.

FÜRST (*Ibid.*) reports the case of a multipara whose labor was delayed by breech-presentation of a large child. The pelvis was slightly contracted in its antero-posterior-diameter. Failing to bring down the breech by the hand, the Simpson forceps was applied to the sides of the hips, and gentle traction made and relaxed during the interval between the pains. After three tractions the breech descended sufficiently to enable the finger to be hooked over the hip. Birth shortly followed, and mother and child made a good recovery. While the use of the forceps in breech-presentation has met with limited acceptance (few have advocated it, with the exception of Tarnier), yet in cases like the above, its application certainly seems justifiable.

CÆSAREAN SECTION AND THE BEST MATERIAL FOR SUTURE.

MÜNCHMEYER (*Ibid.*) reports three cases of Cæsarean section in which the usual Säger operation was performed, making the record of the Dresden

clinic twenty-eight Cæsarean sections, with three maternal deaths and one foetal death. He adds seven cases of amputation of the uterus with the removal of the foetus, performed for septic infection; for uterine tetanus; for threatened hæmorrhage after incision of the uterus and the extraction of the foetus; caused by occluded cervix with contracted pelvis; for highly contracted pelvis, death of the foetus, albuminuria, and beginning septic infection and two cases of highly contracted pelvis, with failure of the uterus to contract after incision, and a case of cancer of the cervix, which had extended so far as to render amputation necessary. All of the mothers in these seven cases recovered, and two of the children survived. Münchmeyer has had the opportunity of examining, post-mortem, two uteri on which the Cæsarean section had been performed. The patients had survived several months, and died by some intercurrent disease. Microscopic examination of the chromic acid catgut sutures employed, found them holding the parts firmly in good apposition, and the suture material itself undissolved, and resembling in firmness silver wire. The silk sutures, however, which had been used to close the abdominal wall, had been partly absorbed. It is Münchmeyer's belief that chromic acid catgut is the best suture for the uterus, and silk the best for the abdominal wall.

INTERESTING CASES FROM THE REPORT OF THE SIMPSON MATERNITY HOSPITAL, EDINBURGH.

KEILLER and ATCHISON (*Edinburgh Medical Journal*, July, 1890) report, among other cases of interest, that of a child born with a caul, which extended over the face, and encircled the neck in such a manner as to prevent respiration. Efforts at inspiration drew the membrane tightly over the face, and rapid removal was necessary to enable the child to breathe. From a medico-legal standpoint the case illustrates a possible cause of infant death.

Two cases of scarlatiniform rash in the puerperal state are also reported, neither attended by fever. The eruption consisted of small red points, with enlarged papillæ, which became blotchy and purplish on the face. The spots coalesced, extending over the chest, abdomen, forehead, face, and on the flexor aspect of the arms. It disappeared on the fourth day, and was attended by itching. No septic complications were to be distinguished in these cases.

RUPTURE OF THE UTERUS.

HART (*Edinburgh Medical Journal*, July, 1890) has met five cases of uterine rupture, all of which died. His fifth case was that of a multipara, who had a shoulder-presentation. The foetus was found high in the abdomen, the uterus was empty. An attempt to draw the child back into the uterus through the rent was abandoned, because the intestine prolapsed into the uterus. Abdominal section was performed; the uterus was lifted up and a strong twine passed about the cervix, and the uterus was amputated, the ligature closing the stump a little above the lower limit of rupture. The peritoneal cavity was shut out from the vagina by the peritoneum, which was stitched into the wound. The uterine stump was treated as usual in such cases.

Hart concludes that in cases in which the child is lying partly in the genital

tract, it should be extracted, if possible, without upward traction on the uterus; this can often be best accomplished by decapitation or craniotomy. If the rent be not extensive, tampons of iodoform-gauze and irrigation may be employed. Where extensive laceration and escape of the child have occurred, amputation of the uterus is the only treatment indicated.

GYNECOLOGY.

UNDER THE CHARGE OF

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OF NEW YORK.

WHAT IS THE PRESENT MEDICO-LEGAL STATUS OF THE ABDOMINAL SURGEON?

POTTER (*American Journal of Obstetrics*, July, 1890) concludes a timely paper on this important subject with the following questions which might assume great importance from a medico-legal standpoint in the case of a suit against a laparotomist on account of a disastrous abdominal operation :

1. What has been the previous training of the surgeon in abdominal operations, and what degree of surgical skill does he display in dealing with the various complications which may arise?
2. Has the propriety of the operation been positively determined, and have its possible risks been thoroughly explained to the patient and her friends?
3. Has the consent of the patient and her friends been obtained "in a legal and binding manner?"
4. Have the preparations for the operation been made according to the most approved rules of modern abdominal surgery?
5. Was the anæsthetic properly administered by an experienced anæsthetizer?
6. Was the operation performed with that degree of skill which is demanded of the successful laparotomist?
7. Was the after-treatment conducted conscientiously, under the immediate control of the operator, a skilful nurse being in attendance?
8. Was the operation performed at the home of the patient, or in a hospital? If done in a hospital, was it public or private?
9. Was the patient removed before or after the operation, and was this done with the advice and consent of the operator?

As regards the rights of the patient and surgeon, the writer adds :

A patient has a right to refuse laparotomy, no matter how urgent may be the indications. She may, after the operation, refuse further treatment from the operator or from the physician who may be in charge. If sane, she has the legal right to insist upon her removal at any time after the operation, and the surgeon can be held liable if he detains her against her will.

The legal control of the husband would not prevent the wife from submitting to an operation if she so desired.

"From the foregoing it will be seen that the physician is absolutely helpless in all cases that he cannot reach and control by moral suasion. This places the abdominal surgeon at a peculiarly trying disadvantage, for he is in the rather anomalous position of incurring grave legal responsibilities in cases where he has few legal rights or privileges."

[This paper, which was evidently suggested by a recent suit for manslaughter brought against a well-known lady physician, should be carefully studied by every abdominal surgeon. The vital importance of this subject has not been appreciated by laparotomists, especially by the younger men, whose success has been so brilliant that they daily assume risks—to themselves—which are positively appalling. No surgeon's reputation is so invulnerable that he can afford to neglect the precautions laid down by the writer. This applies especially to hospital practice. The surgeon is constantly in danger of forgetting that although he may be an autocrat, the patient has rights which may assume startling proportions in a court of law. In a case of laparotomy every step in the preparation, the operation, and the after-treatment should be such as to bear the most searching public scrutiny if need be. It is not enough to obtain the patient's consent, the possible risks must be clearly explained to her friends. Except in a case of emergency, there should be a consultation previous to the operation. In many hospitals there is a standing rule to this effect, but it is usually "more honored in the breach than in the observance."

Success in abdominal surgery does not justify the reckless spirit which seems to animate some of the younger surgeons who are aiming at a "record." It is a wonder that they have thus far escaped unscathed. Sooner or later there will be a catastrophe. In the eye of the law a hundred successful cases will not atone for a disregard of the ordinary principles of ethics in a single disastrous one.—ED.]

ARISTOL IN GYNECOLOGY.

SWIECICKI (*Oester-ungar. Centralblatt für die med. Wissenschaften*) reports twenty cases of endometritis and pelvic exudation in which he used the drug with favorable results as regards the diminution of the discharge and the relief of local pain. He introduced it in the form of vaginal suppositories, or in tampons saturated with a ten per cent. solution, and was unable to explain its action, except so far as it depended upon the presence of iodine.

GAUDIN (*Gazette de Gynécologie*, July 15, 1890) has employed it principally in cases of cervical erosion and endometritis, where it acts most favorably. In epithelioma of the cervix it is not only a powerful disinfectant and deodorizer, but promotes rapid cicatrization. It may be applied to the cervix in the form of powder and in solution, also in suppositories. After curetting the uterine cavity it may be packed with strips of gauze saturated with an ethereal solution of aristol (ten per cent.). When the pure drug is ingested or administered hypodermically no trace of iodine can be detected in the urine, hence there is no danger of toxic effects when it is applied to large, raw

surfaces, as is the case with iodoform. Unlike the latter, aristol has not an unpleasant odor.

THE ACTION OF SALICYLIC ACID UPON THE UTERUS.

LINHART (*Wiener med. Presse*, 1890, No. 49) has found that salicylate of sodium causes relaxation of the uterus, but is antagonized by moderate doses of ergot. In the case of a patient with rheumatism, who was under observation for two years, whenever the former drug was administered alone she complained of pelvic pain and profuse menstruation, but if ergot was given beforehand these symptoms did not appear.

THE USE OF THE CONSTANT CURRENT IN GYNECOLOGY.

NOEGGERATH (*Centralblatt für Gynäkologie*, July 5, 1890) criticises a recent enthusiastic paper by Saulmann, in which the latter stated that in every case of uterine fibroma treated by him the hæmorrhage ceased after the use of the constant current. "Who then," Noeggerath pertinently inquires, "will now venture to perform myotomy, since hæmorrhage can be controlled in four *séances* at the most?" As opposed to Saulmann's statement, he quotes from the records of Apostoli's clinic, in which it was admitted that out of forty-six patients who had submitted to the electrical treatment, twelve were either not relieved, or lost more blood than before. He furthermore shows that a current of such high intensity as that which Saulmann habitually uses (175 milliamperes) is not borne by many patients, and, in short, that the loose statements of the ultra-enthusiasts tend to cast discredit upon a method of treatment the efficacy of which in suitable cases has been well established.

THE TREATMENT OF UTERINE FIBRO-MYOMATA BY APOSTOLI'S METHOD.

ENGLEMANN, of Kreuznach (*Deutsche med. Wochenschrift*, July 3, 1890), from careful clinical studies, arrives at the following conclusions: 1, a retrograde metamorphosis in the tumor sufficient to cause a sensible diminution in its size is seldom observed. Such changes as occur are probably electrolytic, and are confined to the immediate neighborhood of one pole; 2, the diseased endometrium is principally affected by the electrical treatment, as shown by the disappearance of hæmorrhage and leucorrhœal discharge; 3, pressure-symptoms are always relieved, as well as reflex nervous disturbances; 4, although this method of treatment does not offer great advantages over those hitherto practised in cases of uterine fibroid, the latter are still so imperfect that the electrical treatment should be regarded as a valuable adjunct to our previous means of therapy.

CONTRIBUTIONS TO THE STUDY OF GONORRHOEA IN THE FEMALE.

WERTHEIM (*Wiener klin. Wochenschrift*, 1890, No. 25) reports five cases of gonorrhœal salpingitis in which he was able to demonstrate positively the presence of gonococci not only in the purulent secretion, but in the wall of the tube. He believes that when the cocci cannot be found in a case of gonorrhœa of the tube, it is because they are either present in small num-

bers, or have already been destroyed, since the inflammatory process which they set up may, of course, persist after they have disappeared. In proof of this, he calls attention to the fact that, side by side with typical gonococci, he frequently observed bodies of irregular shape which did not stain readily, and yet bore such a close resemblance to the former that they could only be regarded as cocci which were undergoing retrograde changes. Why they should persist in the tube for a year after infection in one instance and for only a short time in another, it is impossible to determine. The writer was the first to discover these microorganisms in the wall of the tube.

PULSATION IN AN OVARIAN CYST.

GERSUNY (*Centralblatt für Gynäkologie*, April 26, 1890) describes a case of ovarian cystoma, over the entire upper surface of which (as well as per vaginam) could be seen and felt a marked pulsation, while two distinct murmurs could be heard on auscultation. The cyst proved to be intra-ligamentous, and was pressed backward in such a way as to overlie the aorta, the pulsation of which was doubtless transmitted through it. The reporter thought that this pulsation, transmitted in all directions, was peculiar to retroperitoneal cysts.

SECONDARY PERINEORRHAPHY.

Under this head SAURENHAUS (*Centralblatt für Gynäkologie*, May 3, 1890) reported, at a recent meeting of the Berlin Obstetrical Society, twenty cases in which he repaired laceration of the perineum at periods varying from five to twenty days after the original injury, with only two failures. The surfaces were freshened by the scissors or sharp spoon, and were united by a continuous catgut suture. In the discussion which followed the reading of the paper the consensus of opinion was in favor of using the continuous catgut suture for the immediate repair of perineal lacerations.

TREATMENT OF ENDOMETRITIS.

TERRILLON (*Bull. générale de Thérapeutique*, August 15, 1890) believes that endometritis is either of septic (puerperal) or of gonorrhœal, less often of traumatic, origin. Local treatment is alone effective, and is not followed by bad results so long as strict antisepsis is practised. The cervical canal should first be dilated, preferably by Vulliet's method, which is less painful and irritating than rapid dilatation, after which curetting or local applications may be employed.

TEMPORARY PARALYSIS OF THE INTESTINES AFTER LAPAROTOMY.

TERRILLON (*Revue de Chirurgie*, 1890, No. 10) reports a fifth series of thirty-five cases of ovariectomy (with one death) among which was a case of intestinal obstruction due to pure paralysis of the muscular coat of the gut, which resisted several applications of the faradic current, but after four days yielded spontaneously. As the operation was prolonged, the writer is inclined, with Olshausen, to attribute this phenomenon to long exposure of the intestines

to the air, although it may be explained by the presence of a slight inflammation of their serous covering. He purges earlier and more frequently than was his custom, and administers naphthol and bismuth in order to prevent the development of tympanites.

PURULENT PERITONITIS CURED BY LAPAROTOMY.

FLEETWOOD (*Australian Med. Journal*, October 15, 1889) reports the case of a girl, ten years of age, with acute purulent peritonitis. Puncture with an aspirating-needle revealed the presence of pus in the peritoneal cavity, which was opened and washed out, first with a saline solution containing corrosive sublimate, and afterward with pure water, and then drained. A cure followed within nine weeks.

LACERATION OF THE VAGINA DURING COITUS.

FRANK (*Wiener klin. Wochenschrift*, 1889, No. 50) met with this injury in a woman, thirty-two years of age, who was brought to the hospital with all the signs of acute anæmia from hemorrhage. On examination the posterior vaginal fornix was found to be completely separated from the portio vaginalis, but the peritoneum was not injured. The wound was sutured, and healed quickly. The patient stated that during coitus she had felt a sharp pain, and that the act was followed by free hemorrhage. The lesion seemed to be due to the fact that intercourse took place in the sitting posture, the uterus being retroflexed, so that the posterior vaginal wall was put on the stretch. The accident, which was rare, was of considerable interest from a medico-legal standpoint.

PÆDIATRICS.

UNDER THE CHARGE OF

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A. F. CURRIER, M.D.,

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AND

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ON THE STRUMOUS DISEASES OF CHILDHOOD AND THEIR RELATION TO TUBERCLE.

MADDEN, in an abstract of a paper read before the British Medical Association, July, 1890, remarks that the increasing proportion of strumous and tubercular affections observed in his wards in the Children's Hospital (Dublin) is probably largely ascribable to the faulty dietetic and hygienic management of early childhood, and to the general substitution of artificial, and very unsuitable, preserved or tinned preparations, for that natural or fresh milk which is essential for the healthy nutrition of children. As he formerly

pointed out, the acute forms of tuberculosis common during childhood resemble the infective diseases in their origin from a specific germ, whether generated in the body or introduced from without. The latter is probably the case in the tubercular diseases prevalent among the children of the poor, in whose dietary various forms of preserved milk-foods now enter largely, as it seems difficult to conceive any certain guarantee that the cows furnishing the supply may not, in some cases, suffer from *perlsucht*, this disease being very prevalent and not materially affecting the quantity of milk. More recently Professor Bollinger has shown that milk may prove infectious whether taken from cows suffering from general or local tuberculosis; in his experiments only a few drops of undiluted milk from a tuberculous cow proved sufficient to produce miliary tuberculosis in animals. Be the pathogenesis of tuberculosis what it may, however, there can, Madden thinks, be no question as to the fact that it is most frequently developed in patients who bear in their general constitutional condition, and more especially in their glandular system, 'the obvious imprint of the strumous diathesis. Nor is it to be wondered at that in children, thus constitutionally enfeebled, the struggle for existence between the invading specific microorganisms and the blood-corpuscles or leucocytes should so speedily terminate in the fatal victory of the prolific bacilli of tubercle.

PHYSICAL EDUCATION IN RELATION TO MENTAL DEVELOPMENT IN SCHOOL-LIFE.

MADDEN, in an abstract of a paper read before the British Medical Association, July, 1890, says that the respective claims of physical and mental training, and the evils arising from the neglect or abuse of either, are obviously questions of the highest medical as well as social interest. This neglect now presents itself in two different aspects. On the one hand, the children of the poor in England are compulsorily subjected at an absurdly early age to a forcing and injurious system of mental cultivation; whilst, on the other hand, in the case of those of a better social position, the physical powers are not uncommonly overtrained at the expense of the mental faculties. Of these errors, the former is the most important, and to its operation is, he believes, largely ascribable the apparent diminution of physical stamina observable in too many of the youth of the present day as compared with the physically more robust, if intellectually less cultured, generation of the pre-educational period.

At the present time, a large part of the first ten years of life, which should be primarily devoted to physical and moral training, is given up to the development of the mental powers: the child, when a mere infant, being compelled to attend some school, where the immature brain is forced into abnormal and disastrous activity. On its return home, jaded in mind and body, to prepare for the next day's task, such a child is necessarily unfit for the enjoyment of the physical exercise which is essential for its bodily development and health, or for the still more important elementary training of the affections and moral faculties, and instilment of religious principles, which are better acquirable from home-teachings than from any school-board system.

During the first eight or ten years of child-life, the amount of mental cultivation which a child's brain is capable of receiving with permanent advantage is much less than is commonly believed. No greater physiological mistake is possible than that of attempting any considerable degree of such culture until the sufficient development of the physical stamina and moral faculties is accomplished. The organ of the mind is as much a part of the body as the hand, and ere either can function properly, its vital force must be fostered and maintained by nutrition and developed by physical exercise.

In connection with the physical management of childhood, he adds a few words on the abuse of alcoholic stimulants. The evils resulting from the abuse of alcohol were never so prevalent as at present, and are traceable in the diseases of youth as well as in those of adult existence. The results of this acquired or inherited alcoholism are brought under clinical observation in the form of cerebral, gastric, and hepatic disorders, and especially cirrhosis of the liver, as well as the protean forms of cerebro-spinal disease, and the various neuroses so frequently noticed in hospitals for children, and to which he has elsewhere directed attention. In the majority of these cases of juvenile alcoholism that have come under his care in the Children's Hospital, Dublin, this tendency appears inherited and most marked in those whose mothers were inebriates—intemperance in women also bearing in other ways on the diseases treated in hospitals for children, where its effects are strikingly evinced by the moral and physical deterioration of the offspring of the drunken and by their special predisposition to strumous, tubercular, and other constitutional taints.

Under no circumstances should alcoholic stimulants be given to children, save in the guise and defined doses of other remedial agents—his experience in hospital and private practice, at home and abroad, having amply confirmed the view expressed in a work of his published many years since, viz., that it is physiologically wrong, as well as morally unjustifiable, ever to allow a healthy child to taste alcohol in any form.

POINTS IN THE DIETETIC MANAGEMENT OF CHILDREN.

RACHFORD formulates the following rules, which will aid us very much in selecting a diet when it becomes advisable to discontinue milk temporarily:

1. Avoid albuminous food (*a*) when marked constitutional symptoms are present; (*b*) when in doubt as to the character of the fermentation causing the disease; (*c*) when the stools are putrid; (*d*) when the stools contain mucus and blood; (*e*) when the nausea is constant and not relieved by vomiting.

2. Avoid carbohydrates as a food (*a*) when there are no marked constitutional symptoms present, and the stools are continuously acid; (*b*) when there is much flatus, pain, or urticaria.

3. When the albumins are to be avoided the carbohydrates are, as a rule, indicated; and when the carbohydrates are to be avoided, the albumins are, as a rule, indicated.

4. Give foods, such as cream, beef-broths, and whiskey (*a*) when the foods prescribed according to the above rules disagree; (*b*) during the first twenty-

four hours in severe acute cases; (c) when in doubt as to the character of the food indicated.—*Archives of Pædiatrics*, 1890, p. 441.

SURGICAL TREATMENT OF ERYSIPELAS.

DILLON-BROWN reports a successful case treated by the Kráske-Riedel method. The patient, an infant of five and one-half months old, was somewhat cachectic, and erysipelas developed in the left leg in the neighborhood of an abscess which had been incised. In spite of the general and local treatment, the erysipelas steadily advanced until the knee was reached. At this time the child's general condition was alarming in the extreme; temperature 104.5° F.; pulse 178, weak and thready; and the case was looked upon as hopeless unless some means were found of preventing the extension of the erysipelas. Under chloroform anæsthesia a fence was made completely encircling the limb by scarifying it with a scalpel. The scarifications were dressed with gauze saturated with 1:1000 bichloride. Immediately after the operation the line of the fence became swollen, red and angry-looking, apparently from the irritation of the dressing. The inflammation rapidly travelled up to the line of the scarification, but did not pass above the barrier. On the following morning the temperature was 100° , and general improvement marked in all symptoms; pulse 120; eyes bright. From this time there was rapid and uninterrupted convalescence and complete recovery.—*Annals of Gynecology and Pædiatry*, 1890, p. 489.

A PLEA FOR EARLY OPERATIVE INTERFERENCE IN ACUTE PERITONITIS, WITH ESPECIAL REFERENCE TO THE SO-CALLED IDIOPATHIC PERITONITIS IN CHILDREN.

LYDSTON presents a careful consideration of this subject in the *Journal of the American Medical Association*, June 28, 1890.

There is a feeling at present among progressive physicians that peritonitis is more of a surgical disease than it has been regarded. The more carefully we inquire into the history, the narrower the range of the so-called idiopathic cases becomes.

Children are very often taken while apparently in a condition of perfect health. This is inconsistent with the idiopathic theory; adhesions and pus are an almost invariable result of idiopathic peritonitis. Gauderon remarks that recovery followed the escape of pus through the umbilicus in eleven cases out of twenty-five, and of these eleven cases there were eight recoveries. It would be interesting to note how many of the fourteen cases recovered, as showing in how far the chances of recovery were directly dependent upon the exit of the pus. Children receive so many bumps and falls that they are not likely to attribute any special importance to an accident. The peritoneum being more sensitive in children, their greater susceptibility to peritonitis from slight injuries is at once obvious.

Very slight injuries to other viscera, especially the liver, may give rise to the disease. The bruising may be so slight as to leave no trace which is visible post-mortem, and yet be sufficient to light up general peritonitis. A bruise over the distended bladder or a wrench of its peritoneal attachments, incidental to a fall, may cause it.

A cause of peritonitis in children is inflammatory affections in the region of the cæcum. Typhlitis and perityphlitis, due to enteroliths or foreign bodies in the vermiform appendix, constitute one of the most frequent causes of so-called idiopathic peritonitis in young children. The reason that this is not more frequently recognized, is the fact that in children the disease runs a very rapid course, has a more pronounced tendency to general extension, and kills the patient before evidences of localized inflammation and suppuration are recognized. The formation of lymph, plastic material, and protective adhesions does not occur in the child because of the rapid extension of the inflammation.

Lydston concludes as follows:

The majority of cases of so-called idiopathic peritonitis in children will be found upon inquiry to be traumatic.

Slight injuries of the abdominal contents are relatively more dangerous in children than in adults.

Acute peritonitis in children, while apparently idiopathic, is often secondary to perityphlitic inflammation, which runs a rapid course and extends to the general peritoneum without the intervention of appreciable local changes.

The profound prostration and cardiac inhibition characteristic of peritonitis are incidental (1) to tension of the peritoneum produced by inflammatory products, with a consequent reflex inhibition of the heart, and (2) mechanical interference with the heart's action.

Surgical interference is indicated in all severe cases of general peritonitis and in cases of localized suppurative inflammation, or in cases of perityphlitic origin.

It is not necessary to make a large incision, excepting in cases in which perityphlitic abscess is known to exist, when the incision should be made at the most favorable point, which is the typical line for ligation of the common iliac. In the majority of cases in children a median exploratory incision, with flushing of the abdominal cavity, is sufficient.

CIRRHOSIS OF THE LIVER IN CHILDHOOD.

In Canada, Howard has recorded two cases; Germany presents eighteen; England forty-four; France fifteen; the United States eight; Ireland four, and India one. This recapitulation will serve to show how very rare is the disease; Flint, in a personal communication to Howard, remarks upon its exceeding rarity in the United States.

EDWARDS presents a study of cirrhosis in the *Archives of Pediatrics*, July, 1890, with a report of one case and a tabulated *résumé* of the literature.

The slight effect that alcohol has in these cases is illustrated by the fact that its habitual use is mentioned only eleven times, its absence being noted in fifty cases, and no mention being made of it at all in thirty-three instances. In six times it is recorded as probable.

The infectious fevers play a more important rôle in the etiology of the disease; the hepatic derangement of fevers may, and often does, persist after they have subsided, and thus is said, independent of syphilitic contamination or alcoholic abuse, to produce chronic interstitial hepatitis.

Hebrard has recorded one case of interstitial hepatitis following measles, with microscopic studies presenting infiltration by newly-formed connective tissue, distention of veins and arteries, and much fatty degeneration; and Klein has examined eight examples of acute interstitial hepatitis in scarlatinous cases.

The case reported by Edwards would seem to be an example of cirrhosis following the infectious fevers, as the child (æet. ten) is not syphilitic and is a non-alcoholic, but has suffered most severely from both measles and scarlatina.

Howard has collated six cases in which cirrhosis seemed to be part of a general fibroid change, and one case in which Gull and Sutton's oft-described arterio-capillary change could be considered as a causative agent.

Tuberculosis may cause an hepatic cirrhosis.

Of late years faulty digestion and the alkaloidal products of albuminous decomposition—the ptomaines—have been regarded as a possible cause of interstitial hepatitis, although the matter is as yet *subjudice*.

Regarding the disease as it occurs in childhood, it may be either atrophic or hypertrophic, not unusually the so-called mixed cirrhosis is met with; some observers regard the latter as rather the usual form in childhood.

The age of greatest frequency is from nine to twelve years; males are more affected than females, in the proportion of almost two to one.

Symptomatology differs but little from the adult. The symptoms at first are apt to be confounded with simple congestion. Digestive troubles exist, abdominal pain, slightly augmented by pressure, alternating diarrhœa with constipation, increase in the size of the liver, slight ascites, dilatation of the subcutaneous abdominal veins, and slight jaundice or a subicteroid tint of the face. Stigmata, composed of collections of dilated minute venules, may be observed on the face; their presence should suggest an examination of the liver, with special reference to the probable existence of cirrhosis.

A large proportion of the cases of infantile cirrhosis present irregularities in the temperature-curves. The case that we are considering presented a temperature which, within a month, fluctuated between 100° and 97½° F. It was quite as apt to be subnormal as elevated.

The prognosis and treatment are as in the adult. Within the last eighteen months cases have been reported that appear to show that the prognosis is not as hopelessly fatal as we have formerly considered it.

INFANTILE CONVULSIONS CAUSED BY THE MILK OF A WORRIED MOTHER.

PACKARD reports the case of a baby, three months old, who was observed to cry after nursing as if in pain, and at the same time the discharges from the bowels became too frequent, and at times were greenish and offensive. At this time the mother had become over-tired, and was low-spirited and dyspeptic. Simple remedies were given to check the diarrhœa, and the family returned to town with the baby, whose gastro-intestinal irritation had then been in progress for a fortnight. During some of the colicky attacks the baby turned its head to the right, and the neck became stiff. These manifestations were so slight, however, and passed over so quickly, that no one but the mother attached to them any importance. The child was removed

from the breast, and the convulsions ceased altogether; the mother within a week nursed it again, and the convulsions returned with gastro-intestinal irritation, green and offensive passages, and symptoms indicating a larger area of brain irritation.

In addition to the rotation of the head to the right, there was also conjugate deviation of the eyes to the right, with flexing and spasm of the left arm and hand, and drawing up of the left corner of the mouth. As before, the spasms lasted only a few seconds, when the child instantly resumed its natural expression, and crowed and laughed as if comfortable and happy.

During and after the seizures the pupils appeared normal.

The baby was at once taken from the mother's breast, and a wet-nurse substituted. Small doses of hyd. c. creta were again administered; bromide of soda in doses of two grains every two hours, with an occasional laxative composed of castor oil and syr. rhei ar., combined with a few drops of paregoric.

The convulsions were estimated to number quite a hundred in twenty-four hours. They were certainly very frequent, but they were not counted.

In this case it will be noted that the convulsive action was so limited and localized that no vital function was disturbed, and the child was thus enabled to pass through several hundred seizures without evident shock to the vital powers.—*Medical Record*, May 24, 1890.

DIPHTHERIA.

DR. PRICE BROWN related the history of a case of diphtheria to the Toronto Medical Society, April 22, 1890, in a child of fourteen months. Patient was greatly cyanosed, but there was no membrane visible in the throat. Vesicular murmur was absent over the chest, and there was bronchial respiration. Resonance was unimpaired. He performed tracheotomy, and there was instant relief and consciousness returned. Though blood and mucus passed freely from the tube, no membrane came away. The child sat up and took milk greedily, and respiration was almost normal.

Next day the child had a convulsion and gradually sank.

Death was not due to stenosis, pneumonia, or bronchitis. He was in doubt as to the cause.

Intensity of the septic trouble, cerebral thrombosis, and overloading of the stomach were suggested as possible causes of the convulsion.—*The Canadian Practitioner*, May 16, 1890.

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OPERATIONS ON THE ENLARGED PROSTATE, WITH A
TABULATED SUMMARY OF CASES.

BY WILLIAM T. BELFIELD, M.D.,
OF CHICAGO.

It is common knowledge that in a considerable number of subjects of prostatic enlargement palliative measures—hygiene and the intelligent use of the catheter—are inadequate to avert or to remedy a fatal cystitis and consecutive pyelo-nephritis. These cases were formerly regarded as virtually beyond surgical aid; aside from the relief of retention by the catheter, or when that failed by puncture, they were abandoned as hopeless. The rise of vesical surgery in the last decade furnished among its early achievements the complete relief of prostatic cystitis by temporary drainage of the bladder, now a standard operation.

Yet this measure, though extremely gratifying in its immediate results, is in theory unsatisfactory and in practice but too often of only temporary benefit. The relief so obtained is of uncertain tenure; the factors which originally induced the malady remain undisturbed: they may, and as experience shows they often do, cause a recurrence of the vesical inflammation. A rational procedure should aim to secure not merely cessation of existing cystitis, but also, by removal of the cause, prevention of its recurrence—a radical instead of a palliative operation. Various measures have been practised to secure this result, especially during the past five years; it is the purpose of this writing to collate

these experiences in order that a definite plan of procedure in such cases may be deduced, so far as present knowledge justifies such deduction.¹

The simplest method of affording lasting relief is evidently the formation of a permanent suprapubic artificial exit, which avoids the obstructing prostate. This measure has been often executed in the past half-century, usually by puncture with a trocar, sometimes by cystotomy, a tube being more or less constantly worn subsequently.² To obviate the frequent dribbling of urine and the wearing of a plug, McGuire, of Richmond, has in eight cases made the fistula run obliquely from the lower end of the vesical wound to the upper angle of the cutaneous incision, some three or four inches long, and bearing "the same relation to the bladder that the spout of a coffee-pot does to the bowl." By this ingenious arrangement the urine can be completely retained, he says, from two to six hours. Morris, of New York, has in one case clothed the fistulous track with skin by transferring narrow cutaneous flaps into the wound at the time of operation, thereby securing a better lining for the fistula and diminishing its tendency to spontaneous closure. (*N. Y. Med. Journ.*, July, 1890.)

The permanent suprapubic fistula is a mutilation obviously to be employed only when the restoration of the urethral channel seems impracticable. Aside from the objections on the score of sentiment and comfort, the fistula cannot be relied upon to secure immunity from cystitis; thus Bennett May mentions three instances of such failure in his own practice. The explanation of the failure is perhaps that the projecting portions of the prostate prevent complete evacuation of the vesical contents; and probably that these tumors, like other neoplasms and foreign bodies, induce mechanical irritation of the bladder. The latter condition seems to have been exemplified in one of May's cases, which, after the fistula had failed to give relief, was entirely cured by the removal of a large middle lobe.

The theory of the radical operation assumes that the cause of chronic retention is mechanical obstruction by the enlarged prostate; that such prostatic obstacles are capable of removal; and that after such removal the bladder will resume its function of voluntary evacuation.

These propositions have been separately and collectively denied by three of the foremost among living genito-urinary surgeons—Thompson, Guyon, and Socin. Guyon³ maintains as a deduction from histological

¹ To the many surgeons who kindly responded to a request for their personal experience, as well as to the editors of medical journals who assisted him in the collection of information, the writer desires to express his deep appreciation of the courtesy received.

² "Supra-pubic Cystotomy for Purposes other than the Extraction of Calculus," by J. H. Packard, *Trans. Amer. Surg. Assoc.*, 1887, contains an extended account of these operations.

³ *Annales des Mal. des. Org. Gén.-urin.*, March, 1885.

researches that prostatic enlargement is but a local manifestation of a general senile "sclerosis," which pervades the entire urinary tract; that the chronic retention is chiefly due not to prostatic obstruction but to the coincident impairment of vesical contractility caused by sclerosis of the bladder muscles; hence that the removal of prostatic obstacles is irrational and futile to restore voluntary urination. He asserts further as the result of post-mortem observation that the prostatic obstacle is rarely of such contour as to permit its removal by the surgeon. Socin advances essentially the same opinions. Thompson, while repudiating sclerosis as the cause and assuming that enlargement of the prostate is an attribute of senility, endorses Guyon's conclusions.

These are, however, conjectures unsupported by clinical experience. Thompson and Socin have not yet performed—or at least have not published—a single radical operation; Guyon made his first attempt in July, 1889, and found a prostatic growth readily removed.

The accumulated clinical observations of the past five years prove that these traditions of the earlier surgeons, upheld by Guyon and Thompson—which have dominated surgical opinion and practice—must be restricted to a minority only of prostaties.¹ For it is clearly demonstrated—

(1) that there is a larger class, entirely distinct from these, in whom the failure to evacuate the bladder is due in no wise to degeneration of the vesical muscles, but solely to the mechanical obstruction offered by prostatic growths; since the removal of such obstacles has been followed in over two-thirds of the cases previously dependent upon the catheter, by restoration of the vesical functions.

(2) It is shown that the enlargement of the prostate commonly called "senile" hypertrophy is not limited to advanced life. Thompson has strenuously taught that "it never appears but in advanced years," the minimum age being fifty-six; "I have never been able to meet with an instance of its occurrence at so early a period as fifty-three years of age." Many others have seen it in younger men: McGill removed a prostatic collar, "the size of a large walnut," from a man aged fifty-three; M. Schmidt, a large middle lobe from a man of fifty-two; the writer has removed a prostatic growth from a patient aged forty-nine; Dunn excised a tumor of the lateral lobe from a man of forty-five; Iversen described a case at thirty-six years, which Güterbock says is no rarity. H. G. Mudd, of St. Louis, exhibited to the Association of Genito-urinary Surgeons, June 3, 1890, an extreme example of prostatic hypertrophy

¹ The writer takes the liberty of using this word to avoid the frequent circumscription—"subjects of cystitis with prostatic hypertrophy;" the German *prostatitis* and French *prostatique* have long been standard equivalents. The term "prostatism" is also a needed designation for the condition discussed.

² Diseases of the Prostate, 1886, pp. 92, 93.

from a negro aged twenty-seven; the prostate and its outgrowths literally filled the true pelvis, and on microscopical examination were found to be fibro-myomatous without a suspicion of malignancy. On the same occasion Dr. Mudd mentioned a case of true prostatic hypertrophy, under the observation of Dr. H. H. Mudd and himself, in a child of five years.

(3) That the prostatic obstruction is usually—contrary to the opinions of Guyon and Thompson—of such form as to permit excision, is shown by the fact that in sixty-two out of seventy-seven cases of supra-pubic incision, such obstacles were found and removed. These tumors when microscopically examined have been reported as fibro-myomata, enclosing more or less glandular structure.

The assumptions upon which the radical operation is based are therefore justified by experience; it is proven that in many prostatics the source of the evil is to be sought not in sclerosis nor senile degeneration of the bladder, but in mechanical obstruction by prostatic tumors; that these tumors are not a product of sclerosis, nor of senility, nor even limited to advanced life; their greater frequency after forty years of age is paralleled by that of other tumors, particular the fibro-myomata of the homologous organ, the uterus¹—which are not considered an attribute of senility; that these tumors are in most instances susceptible to removal; and that in such cases a well-executed radical operation restores voluntary urination.

It is indisputable, however, that in many prostatics of advanced age a degeneration of the vesical walls coexists; the contractility of the bladder is seriously impaired, and removal of the prostatic obstruction fails to restore voluntary evacuation of the organ. The proof of this condition is furnished, as Guyon points out, by occasional cases of chronic retention and cystitis in elderly men *without* prostatic obstruction or other mechanical obstacle; the failure to evacuate the bladder being due simply to impairment of the vesical contractility. In nearly one-third of the cases on record the radical operation failed to restore voluntary urination; while in several it is evident that the removal of

¹ The structural identity of prostatic tumors with uterine fibroids has been demonstrated in the last half-century by various surgeons and pathologists, including Velpeau, Paget, and Billroth. The clinical analogy seems equally striking; rare in young women, the frequency of uterine fibroids increases with age until at the climacteric the percentage fully equals that of the corresponding prostatic disease in elderly men (Bayle, Klobi). With the cessation of the uterine function, the formation and growth of fibroids usually cease.

Since the functional activity of the prostate persists later in life than that of the uterus, its tumor-formation naturally continues to a more advanced age, ceasing, however, at sixty-five to seventy. The climax of this tumor-formation may be contemporaneous with, though independent of, the senile degenerations permeating the urinary tract, as well as other tissues; the occurrence of both in the same subject seems a pure coincidence.

the obstacle was incomplete, yet in others the explanation of failure seems to have been impaired vesical contractility.

Differentiation between the obstructive and degenerative factors in a given case should naturally precede operative measures. At present such differential diagnosis cannot always be accurate; the subject of pronounced sclerosis exhibits rigid arteries, polyuria, and often hæmaturia (Guyon); his prostate is extremely hard; the flow of urine through the catheter is feeble; complete evacuation of the bladder is accomplished only by pressure upon the hypogastrium. In the presence of these symptoms restoration of voluntary micturition cannot be expected; the radical operation is useless except to facilitate difficult catheterism—unless, indeed, Kümmell's success in gradually restoring vesical contractility by means of strychnine and electricity, shall be found frequently capable of repetition.

MODES OF OPERATION.—Prostatic obstacles to urination have been attacked by four routes:

1. The urethra (Mercier, Bottini).
2. Perineal incisions (Harrison, Keyes).
3. Supra-pubic cystotomy (Dittel, Belfield, Kümmell, McGill).
4. Combined perineal and supra-pubic incisions (M. Schmidt, Belfield).

The operation should secure three results: restoration of a low-level urethra by removal of prostatic obstacles; temporary drainage of the bladder; and stretching of the prostatic urethra. The choice of operation is, therefore, a mechanical problem, determined largely by the accessibility of the prostatic obstruction. Now, these present the greatest diversity in size, shape, and location; whether the obstruction is a distinct tumor, median or lateral, sessile or pedicled, intra-vesical or intra-urethral; or a so-called bar; or a combination of these—can be in only exceptional cases more than conjectured by any means other than digital contact, which is, therefore, the first essential of every accurate radical procedure.

This condition obviously excludes from serious consideration all operations from the meatus, and shows the limitations of operations through any perineal incision, since the average finger is too short to explore or even to reach the vesical orifice from the perineum when the prostate is much enlarged. Operations from the meatus are evidently, in the light of present experience, tentative, haphazard procedures; they were based upon the faulty conception that the prostatic obstacle is always a bar or other median obstruction; and that the division of this supposed bar would effect relief. A scrutiny of the appended cases shows how seldom such a procedure could have removed the obstacle to urination. These operations of Mercier secure no one of the three essentials sought; they contain, moreover, elements of danger foreign to the later procedures where the cutting-edge in the bladder is directed and controlled by

digital contact. Although Mercier is said to have operated over four hundred times, but little definite knowledge of his results is procurable; his followers have been few and his operations seem now to possess only historic interest. Bottini's modification of Mercier's operation—the substitution of a cauterizing- for a cutting-edge—is equally unsatisfactory and seems to have found no adoption; though in a letter dated May 8, 1890, Prof. Bottini kindly writes that he has performed it in sixty-four cases, with “entire success in fifty-four, imperfect in four, and in six without profit.”

That *lateral perineal cystotomy* affords a means for the removal of prostatic outgrowths is shown in the repeated occurrence of this accident—for it was always unintentional and undesired—to Ferguson, Gross, Cadge, Williams, and other lithotomists for generations back. More recently a median tumor discovered during lithotomy has been in several instances intentionally removed (Dittel, Keyes, Landerer, Billroth, Frank). Prostatectomy by this route seems, however, never to have been practised except as an incident to lithotomy; the extensive incision appears to have no compensatory advantage over less formidable and more satisfactory modes of approach.

Perineal urethrotomy has been employed in some thirty cases as the avenue of access to the prostatic obstacle; small median tumors (“middle lobes”), transverse muscular bands, and lateral lobes have been incised or excised. Yet many cases are not susceptible to satisfactory operation by this incision; the finger often fails to explore the vicinity of the vesical orifice when the prostatic urethra is greatly lengthened and the rigidity of the prostate seriously restricts the use of instruments passed with the finger through this incision.

The surgeon may therefore fail to detect the obstructing portion, or find its removal impossible. Thus Wishard was unable to remove the obstruction by perineal urethrotomy, but subsequently found and excised a median tumor by a suprapubic incision. J. D. Thomas failed to detect during perineal prostatotomy a large lateral outgrowth which was discovered at the autopsy two years later (personal letter). McGill says that “in only three of the twelve cases on which I have operated would it have been possible satisfactorily to remove the projecting portions of the prostate by the perineal incision.”

In Case 9 of the table the writer failed to determine the outline of the obstruction tunnelled from the perineum; at the autopsy seven months later, the obstacle was found to be a median tumor, having the size and shape of a walnut, with a relatively small attachment; it could have been readily removed by suprapubic cystotomy, a fact which induced the adoption of this incision in subsequent operations. Possibly the failure of perineal operations to restore voluntary urination has in

various instances been due to incomplete operation, the surgeon failing to discover the extent of obstruction.¹

Since the perineal incision will certainly fail in a large percentage of cases to afford access to intra-vesical obstacles, and since it is impossible to distinguish in advance the cases suitable from those inoperable by this incision, it is apparent that a better method, one applicable to every case, is required.

Suprapubic cystotomy seemed at first to fulfil every requirement; it secures minute exploration of the entire vesical surface of the prostate, the easy recognition and complete removal of the intra-vesical projections, and thorough drainage of the bladder. Prostatectomy² by this incision has been performed over eighty times with satisfaction to the operator and often with results most gratifying to the patient. Yet in several instances this operation has failed to detect or to remove the prostatic obstruction; failures which direct attention to the fact—rather obscured by the many brilliant successes in removing intra-vesical growths—that the object is to restore a low-level channel through the prostate, and not simply the excision of salient tumors. To this end exploration of the urethral is quite as important as that of the vesical surface of the prostate. For the canal may be distorted by growths imperceptible or inaccessible from the bladder; especially frequent is a pronounced thickening of the suburethral prostate, whereby the urethra is elongated and the vesical orifice displaced upward. In five cases recorded in the table such a mass has baffled the surgeon who approached it by suprapubic incision; in two (McGill) it could not be satisfactorily removed; in a third (Guyon) the partial removal was insufficient to restore the channel; in the remaining two this obstruction was overcome by perineal incision and stretching (M. Schmidt, Belfield). These cases seem worthy of detailed relation, because they demonstrate the occa-

¹ Watson, in his valuable monograph (*Operative Treatment of the Hypertrophied Prostate*, Boston, 1888), formulated the conclusion from a study of thirty anatomical specimens, that in two-thirds of the cases a radical operation can be thoroughly performed through a perineal urethrotomy by anyone with an index finger of at least three inches working length. The anatomical relations of the prostate in the unopened body are, however, so entirely different from those of the excised and incised specimen that conclusions based upon the latter should hardly be applied to the living subject. Moreover, as McGill tersely observes, "it is unwise to commence an operation with the probability of failing in one-third of the cases," and "it is not advisable to limit the ability to perform an operation to gentlemen with preternaturally long fingers." It is gratifying to know that Dr. Watson's further clinical experience leads him to restrict to narrower limits the feasibility of the perineal operation (personal communication, June, 1890).

² The obvious etymological inaccuracy of this term is still of slight moment, since the real "prostatectomy"—extirpation of the entire prostate—is as yet a rare experiment.

sional insufficiency of the suprapubic operation to restore a proper channel through the prostate.

M. Schmidt, after removing a middle lobe by suprapubic incision and inserting a finger-tip into the vesical orifice, found a small but hard mass posteriorly, which was inaccessible from the bladder. Upon recovery the urinary symptoms returned, voluntary urination was still impossible, and the catheter met a distinct impediment in the prostatic urethra—in short, the channel through the prostate was still seriously obstructed. A month later Schmidt reopened the wound, but found no obstruction at the site of the former tumor. He then made perineal urethrotomy, stretched the prostate, and with a bistoury incised the hard mass at the posterior edge of the vesical orifice; perineal drainage was maintained for five weeks, when after a second stretching of the prostate the wound was permitted to close. After this the patient—who had been entirely dependent upon the catheter for a year—recovered the power of normal urination, which continued unimpaired during the time of observation, eighteen months. This carefully-observed case suggests the possibility that the failure to recover the vesical function after suprapubic operation may have been in other cases also due less to an assumed degeneration of the bladder than to a neglect to recognize urethral obstacles whose importance Schmidt so plainly demonstrated.

Guyon's patient was in good general condition, the bladder retaining largely its contractility; voluntary micturition very incomplete and catheterism difficult from prostatic obstruction. Suprapubic exploration showed an enlarged left lobe and a bar connecting the lateral lobes three-fourths of an inch high and one-half of an inch broad; this was found by trial to be the obstacle to catheterism. A portion of the enlarged lobe and of the bar was removed by cautery, after which the catheter entered the bladder readily. Eight weeks after operation catheterism had become as difficult as formerly, the obstruction being located at the same point; voluntary urination was not restored. Guyon believes that the loss of substance in the bar made by the cautery had been filled in by new tissue; and that the prolonged pressure of a perineal tube (*à la* Harrison) would have averted this result.

McGill reports two nearly duplicate cases in which the prostate is described as "very hard; a small projecting middle lobe blocks up the urethra like a bar. A small piece the size of a pea was removed (suprapubically) with difficulty." The patients derived no appreciable benefit from the operation. The conjecture seems warranted that Guyon's and McGill's cases belong in the same category as Schmidt's; the suprapubic operation removed but part of the obstruction, the remainder being accessible from the perineum only.

In a patient forty-nine years old a mass about the size of a walnut

was enucleated from the left lobe after suprapubic incision. The finger inserted into the urethra detected a small mass in the floor of this channel which obstructed a catheter, but could not well be reached from the bladder. The *boutonnière* was accordingly made; the finger introduced from the perineum met the same obstruction. This was incised preparatory to a thorough stretching of the prostate, when the finger, again introduced from below, unexpectedly dislodged the mass and pushed it into the bladder. It was found to be a small, distinct tumor.

Since the operation (four months) voluntary and complete evacuation of the bladder has continued, and the catheter enters easily. This patient had been advised more than a year previously to use the catheter regularly, but because of the difficulty and pain of introduction had made but desultory use of the instrument; urination, though voluntary, had been very incomplete.

It seems, therefore, that by suprapubic incision alone the surgeon may find himself unable to restore the patency of the urethral channel; that the intra-vesical projections may in a given case constitute but a part of the prostatic obstruction; that the discovery and removal of such outgrowths are not necessarily a complete operation. The prostatic urethra should be stretched and explored by the finger; and the discovery of a hard mass or an unduly rigid ring should be the signal for perineal urethrotomy, incision or excision of the resisting tissue, and thorough stretching. Kümmell supplemented the suprapubic excision of tumors by sinking the cautery into the prostatic substance—an imperfect substitute for the perineal operation. It seems probable that the combined operation by both suprapubic and perineal incisions will become the rule rather than the exception; the addition of the *boutonnière* increases but slightly the injury to tissue and the time of anaesthesia, while it affords an access to the entire prostate which may convert an utter failure into a complete success.

RESULTS.—An estimate of the value of radical operations must be based upon a comparison with the results of simple drainage of the bladder; since the latter is included in the former and alone secures cessation of existing cystitis, subsidence of the congestive œdema of the prostate, and an improvement—more or less temporary—in the evacuation of the bladder. The radical operation should accomplish more; it should restore voluntary and complete urination in the individual who has long been largely or entirely dependent upon the catheter. For this estimate many of the 133 reported cases are useless; for in some the previous and subsequent history is not recorded; in others the operation was made for acute retention without previous dependence upon the catheter (where simple drainage would have afforded relief); and in a third class the prostatic enlargement was complicated with a calculus,

to whose removal the recovery of the vesical function might be largely ascribed.

Excluding these, there remain 41 cases wherein the catheter was indispensable for periods varying from several months to seven years prior to operation. In 32 of these 41 voluntary urination was restored and maintained during the period of observation, varying from a few months to two years; in only a few is it, however, definitely stated that the evacuation of the bladder was complete as well as voluntary; in several residual urine was noted and the daily passage of the catheter was advised as a precautionary measure. In 9 of the 41 cases voluntary micturition was not restored. As elsewhere observed, it seems probable that the failure in some of these was due to incompleteness of operation.

The mortality of prostatectomy (13.6 per cent.) seems somewhat greater than that of cystotomy in elderly men for other purposes, particularly the removal of calculi; though due to the same causes—uræmia, shock, and irritation of the respiratory tract by the anæsthetic. In other words, the hazard of the operation is entirely due to the preëxisting disease of the urinary tract as well as to the enfeeblement of vitality from age and protracted suffering; and its excess of mortality over lithotomy must be ascribed to the greater delay in operating. In only one case was serious disturbance caused by the local interference with the prostate: Dittel, after removing a median growth with the *écraseur*, observed suppuration in and around the prostate; the abscess was opened from the perineum by separation of the rectum, after which the patient recovered.

The obvious deduction is that the operation should be performed earlier in the course of the disease, and not as heretofore deferred until the last stage: corroboration of this inference is found in the paradox that operations upon the prostate, complicated with calculus extraction, furnished a much smaller mortality (1 in 26 suprapubic, or 3.8 per cent.) than the uncomplicated prostatectomies (11 in 63, or 17.5 per cent.). A calculus was, therefore, an advantage rather than an injury, since its presence led to early operation.

It is also noteworthy that among the cases complicated with calculus the recovery of voluntary urination is much smaller (52 per cent.) than among the uncomplicated operations upon the prostate (81 per cent.). The explanation, though conjectural, seems to be that the removal of the stone was the principal object; the prostatic operation was usually a mere incident, negligently performed.

Opportunity is still lacking—because the operation is so recent—to determine decisively whether the restoration of voluntary urination is permanently assured; further experience must show whether new tumors may not frequently develop from the unexcised prostate, causing a recur-

rence of the original morbid condition. Actual observation on this point is limited as follows: (1) In twenty-four cases unobstructed urination and catheterism have persisted for periods ranging from six to thirty-two months after removal of prostatic obstacles; (2) in two cases actual inspection of the bladder three months after operation (Kümmell, M. Schmidt) showed no further tumor-formation.

On the other hand, B. Schmidt observed at an autopsy, nine months after the removal of a median enlargement, that a new growth had appeared near the site of the one removed; the description strongly suggests a malignant tumor rather than a prostatic myoma, but no microscopical examination is recorded. An important deduction from these considerations is the indication for thorough enucleation of all circumscribed masses within as well as above the general prostatic surface. Such tumors can be enucleated after incision of the mucous membrane with surprising facility; McGill especially has demonstrated the feasibility of this measure in many cases of his extensive experience. Vignard, experimenting upon the cadaver, corroborates this observation; he asserts that in six out of ten cases he has enucleated the entire prostate—hypertrophied or otherwise—with reasonable ease.

A second cause may in time abolish the restored voluntary urination, namely, the supervention of vesical degeneration and loss of contractility. Yet this possibility constitutes an argument for, rather than against, the operation, since the necessary catheterism is facilitated thereby.

The abstract utility of prostatectomy is as yet clinically restricted by the fact that so many patients requiring the operation are when they reach the surgeon too feeble to endure it. For this reason the writer has, for example, refused to advise the operation in several cases, made simple drainage by perineal urethrotomy in five (with one death); and in four others (two fatal), in which the suprapubic incision was imperative for the extraction of a calculus, has declined to interfere with prostatic tumors whose removal presented no mechanical difficulties—simply because the enfeebled condition of the respective patients forbade all operative measures that were not absolutely necessary for immediate relief. In time patients will be educated to the knowledge that danger lies not in the operation but in the delay whereby the urinary organs are disorganized.

CHOICE OF OPERATION.—The various operations mentioned represent as many stages in the development of surgical conceptions as to the nature and accessibility of the prostatic obstacle. The operations of Mercier and Bottini may doubtless, by a happy chance, secure occasionally complete success, though inapplicable to most cases; perineal incision and excision of prostatic obstructions have a wider range of usefulness, seriously restricted, however, by the mechanical difficulties in the detection and removal of the common intra-vesical growths; suprapubic cystotomy

affords satisfactory access to these frequent tumors, but sometimes fails to clear the obstructed urethra; the combined suprapubic and perineal approach seems alone to fulfil every indication in every case. There is, therefore, from the anatomical standpoint, no choice of operation; suprapubic cystotomy, with or without a supplementary *bouttonnière*, as the peculiarities of the prostate in a given case may require, is in the abstract *the* operation.

Yet the interests of the patient will, doubtless, sometimes be better served by a compromise with the requirements of his prostate; perineal prostatotomy is perfectly free from anatomical dangers, and, because so quickly completed, involves less peril from the anæsthetic. It is, therefore, safer (mortality 9 per cent. against 16 per cent. by suprapubic prostatectomy); it affords temporary relief in all cases and a radical cure in a fair minority—for which reasons it should, in the writer's opinion, be the operation of choice in feeble patients.

CONSIDERATIONS OF TECHNIQUE.—As to the technique of suprapubic cystotomy, it needs only remark that the Petersen rectal bag has been quite largely abandoned and the modified Trendelenburg position adopted for eliminating the peritoneal fold from the field of operation. The transverse incision of the soft parts and Helferich's partial resection of the symphysis seem to be regarded as unnecessary features. The extreme distention of the bladder formerly considered an essential safeguard is no longer practised, since with the patient in the inclined posture an almost empty bladder can be opened with safety.

An important advance in the removal of prostatic obstruction is the enucleation of all accessible masses in the substance of the organ instead of a simple levelling off of projecting tumors by scissors or cautery; by this means not only the salient middle lobes, but also the no less obstructing, though less obtrusive lateral enlargements, are easily removable. This process of enucleation obviates the necessity for the operation suggested by Dittel, under the title of "lateral prostatectomy."¹ After emphasizing the importance of the neglected lateral lobes in the induction of retention, and criticising Harrison's plan of treating them by prolonged pressure as inefficient, Dittel shows that they can be reached by separation of the rectum from the prostate; and by operation upon a cadaver with lateral enlargement of the prostate, he proved that the excision of portions of the lateral lobes from the rear—without opening the bladder—relieved the prostatic obstruction by permitting the vesical surfaces of these lobes to fall apart. He admits that suprapubic cystotomy would also often be necessary for the removal of intra-vesical obstacles; and that the two operations, even if separated by an interval of weeks, would rarely be sustained by the same subject until patients

¹ Wiener med. Woch., No. 19, 1890.

are educated to submitting to them at an early stage of prostatic disease.

Dittel makes no allusion to the fact that the lateral lobes can be and have repeatedly been removed by enucleation after suprapubic cystotomy. Of the several surgeons who have independently adopted this measure McGill deserves especial mention; in several instances he has enucleated lateral masses weighing from one-half to two ounces. The ingenious operation suggested by Dittel seems, therefore, to have been anticipated by a much simpler, safer, and more practicable means of attaining the same end.¹

Prolonged retention of a tube in the perineal wound, as advised by Hrrrison, has been attended in his and other hands with one unpleasant result—the persistence of a permanent and obstinate fistula.

Wishard, of Indianapolis, has successfully practised a means for obviating this objectionable sequel: When the tube is finally removed he cures the granulating surfaces, incises the anterior and posterior angles, and closes the entire wound by sutures, drawing the urine by catheter for several days. By this means he secured immediate and complete union after drainage for periods up to eighty-one days. (Personal communication.)

SUMMARY OF TABLE.

To economize space, the writer's original intention to print the tabulated cases, has been deferred.

		Restoration of voluntary urination.		Deaths.	
		Successes.	Failures.	Within 15 days.	15 to 30 days.
Perineal operations, 41	32 uncomplicated . . .	14	4	3	0
	9 complicated with calculus extraction . .	3	3	1	0
	Totals	—17	— 7	— 4	— 0
Suprapubic operations, 88	62 uncomplicated . . .	21	5	7	3
	26 complicated with calculus	8	7	2	0
	Totals	—29	—12	— 9	— 3
By combined incision, 4	. . . . .	3	0	0	1
Totals, 133	Totals	—49	—19	—13	— 4

Period of observation after operation during which voluntary urination was maintained (in no case did catheterism again become necessary :

In 7 cases	. . . . .	2 years or more.
" 5 "	. . . . .	18 months to 2 years.
" 3 "	. . . . .	12 to 18 months.
" 9 "	. . . . .	6 to 12 months.
" 5 "	. . . . .	under 6 months.

¹ At the recent Berlin Congress, Kuester stated that he had in two cases successfully performed the operation as suggested by Dittel.

Results of operation in cases in which the catheter had been indispensable and constantly used for periods varying from a few months to ten years prior to operation :

	Recovery of voluntary urination.	Failure.	Incomplete recovery.	Total.
Perineal operations . . .	13	7	0	20
Suprapubic operations . . .	22	11	2	35
Combined operations . . .	3	0	0	3
Totals	38	18	2	58

Same without calculus or other complication ; catheter indispensable for periods varying from six months to seven years prior to operation :

	Recovery of voluntary urination.	Failure.	Total.
Perineal operations . . .	11	4	15
Suprapubic operations . . .	18	5	23
Combined operations . . .	3	0	3
Totals	32	9	41

Causes of death.					Within 15 days.	Between 15 and 30 days.
Shock					4	0
Uræmia (surgical kidneys) . . .					4	2
Pneumonia					2	0
Bronchitis					1	0
Iodoform					1	0
Not specified					2	0
Exhaustion					0	1
Totals					14	3

Form and location of prostatic growths removed :

Median tumors	37	Collar enlargements . . .	7
Lateral tumors	9	Horseshoe enlargements . . .	3
Median and lateral tumors . . .	5	Diffuse enlargements . . .	2
		Total	63

SOME OBSERVATIONS ON THE TREATMENT OF GROUPOUS PNEUMONIA.

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THE treatment of pneumonia varies with the theories of its nature and pathology held by therapeutists, but can be resolved into three distinct kinds :

1. The expectant method, which consists in the use of remedies of a non-perturbating kind, so that, whilst the natural course of a disease is

not interfered with, a favorable termination is supposed to be brought about or promoted by their administration.

2. The symptomatic, in which the state of certain functions forms the basis of treatment, *e. g.*, the tension and rate of the pulse, the state of the respiratory system, the rate of breathing, the variations of the temperature, etc., and these symptoms guide the use of remedies for the conditions observed.

3. The third—the specific—is based on the existing knowledge of germs and of their relation to disease-production. The medicinal agents called *antiseptics* have the power to destroy pathogenic organisms without seriously hurting the tissues in which these bodies find a nidus. On first view, it would seem that no remedies can act more certainly; and that the only rule necessary to guide the administration is—the organism present, what antiseptic will effect its destruction? In actual practice we do not find that the result is so easily arrived at. When a pathogenic organism has entered the system, its position, diffusion, and products are not easily ascertained and reached, indeed, if some of them ever become accessible to the most powerful antiseptics in use. Again, microbes may have gained access to the remoter parts of the system, may have attacked and destroyed the tissues in which imbedded, and have ended their brief period of physiological life before the symptoms characteristic of their presence are recognized. In such instances we may have to encounter not the microbe and its progeny, but those toxic products it is their function to produce.

In the method for treating pneumonia now submitted to the medical profession I employ the several remedies partly—indeed, chiefly—in accordance with the specific plan, an outline of which has been briefly sketched. That is to say, the remedies most effective are supposed to destroy or inhibit the pneumococcus, and accomplish the object in proportion to the quantity of the parasiticide reaching the lungs. To do this implies the use of the remedy by inhalation. This remedy is *Ethyl Iodide*. The influence exerted by it on the cough, the labored breathing and general *malaise* is a remarkable fact. It has the signal advantages that no apparatus is required, it vaporizes at ordinary temperature, it causes no irritation of the mucous membrane, and it does not act as an anæsthetic. It can be given on a folded handkerchief, dropped in such doses as may be necessary, or it may be inhaled from a wide-mouth vial which has been gently warmed in advance. As full an inspiration as the patient can make is then practised, and the vapor, thoroughly diffused through the air, glides into the ultimate air-sacs, whence, also, it passes into the blood.

The physiological actions of ethyl iodide are antiseptic and depurative or eliminant. It has some germicide power, there are good reasons for believing, but it does not stand amongst the more effective. There are

instances of parasiticide effect exerted by the weaker antiseptics against the most resistant microbes, and *vice versa*. The bishop bacilli, therefore, may find ethyl iodide especially repugnant or inimical to them, whilst far less resistant organisms, or some apparently so, cannot be overcome except by the most powerful antiseptics. In this question we have an illustration of peculiarity or idiosyncrasy, and not some exercise of power which would seem to be an expression of intelligence guided by will. The effects of ethyl iodide are both local and systemic—locally on the parts impinged upon in entering the system, and systemic in that, diffusing into the blood, it is necessarily conveyed to all parts. The local action may be referred to its chief constituent—iodine, often called *alterative*—a misleading word.

What explanation soever may be true of its action, all of the cases were apparently much benefited by the inhalation, and all expressed a sense of relief to the general *malaise*, and to the specific symptoms, cough, bronchial irritation, and expectoration—the last mentioned being soon changed in character and in quantity.

The manner of conducting the inhalation consisted in dropping the requisite dose (m xx-ss) on a folded handkerchief lightly laid over the mouth and nose, by the patient if able to do so, or by the nurse when necessary. No complaint was made of the action except some dizziness, and this occurred in a few only.

Calomel has proved to be a remedy of exceptional value in my cases, but it must be given judiciously. Three grains at a dose two or three times at the outset of the disease have been sufficient. The effects have been antiseptic, hepatic, and antipyretic. The grounds for its administration in croupous pneumonia are the following:

A dose of three grains acts freely on the intestinal canal; the biliousness present in all cases of true croupous pneumonia is much diminished, the febrile temperature declines, and the dryness and heat of the surface are replaced by a refreshing moisture. The very obvious relief thus afforded is not permanent, but the administration of another dose in a day or two will serve to maintain the beneficial effects of the first; and a third dose may be given if required. I have not in the four cases, the basis of these observations, exceeded in any case two doses; but I am aware that three might be required.

If it is asked how calomel can effect such important changes in the morbid complexus, I find the reply is—its influence on the liver and its power as an antipyretic. It has long been known that calomel acts on the hepatic functions, relieving the so-called "*biliousness*." Now, as biliousness implies over-production of bile, and therefore an irritative state of the hepatic cells and parenchyma, it follows that calomel does not increase but lessens the over-action, or in ordinary language, lessens the biliousness, and by an action which is wholly reflex causes more bile to

appear in the stools. Experiment here coincides with clinical observations. Recent investigations, both in animals and in man, have demonstrated that calomel lessens the production of bile, and by its purgative action, reflexly, causes the bile stored up in the ducts and in the gall-bladder to flow into the intestines. I do not find anywhere a reference to the state of the liver, as playing the part of one of the factors in causing the high temperature of pneumonia. It seems to me that the true explanation is the following: It is a well-known fact that the blood of the hepatic veins is much higher in temperature (two or three degrees) than the blood of the portal—thus showing that the chemical processes taking place in the liver have the effect to raise the heat of the mass of blood in the organ, and soon after, of the whole mass in the circulatory system. It follows therefore from this, that an agent acting as calomel on the functional processes of the liver, must lower the heat-production also. In these facts, do we not have an explanation of the mode in which calomel acts as an antipyretic in croupous pneumonia, in which the condition of the liver is one of increased action and overproduction? As to the production and disposition of the glycogen of the liver, in croupous pneumonia, nothing is known; but it is a reasonable presumption that it is produced in greater quantity, in a ratio corresponding to the increase in the amount of bile. As glycogen has been found everywhere in the body, and as it is a material which by oxidation furnishes force, including heat, it is clear that an increased amount of this substance serves to raise the temperature. The lessened chemical activities in the liver mean, therefore, a diminution of febrile heat of the body generally.

A not uncommon symptom in the course of croupous pneumonia, during the highest range of the temperature, is delirium. Some peculiar mental disturbances occurred in my cases—such as confusion as to time and place; and although in no instance was the delirium wild and maniacal, there was considerable mental disturbance in two instances. When wakefulness is also present the most effective remedy is chloral, and indeed as this medicament has some peculiar powers, it should be made use of early rather than its administration be postponed to a later time. It was shown originally by Dr. Benjamin Richardson, I believe, that chloral has distinct power to dissolve the fibrin masses and exudates. Excepting the dangers of its use, there is much to recommend chloral as a remedy for the results of inflammatory action. It has always seemed to the writer that its action in pneumonia was peculiarly favorable, and that smaller doses were effective relatively more than is usually found to be the case in other maladies.

Something must be said of bloodletting in the treatment of pneumonia. It must be very rarely necessary to practise venesection, but I am clear that the application of leeches is often desirable. In two of

my cases I had leeches (six Swedish, to fill and fall off) applied with the effect to relieve the pain in the side and to give general relief. The other cases seemed not to require them and certainly did as well. Had there been such a condition of the general circulation and of the respiration as had indicated it, I would not have hesitated to practise venesection.

The subject of nutrition, or support of the powers of life, has been regarded of prime importance in the treatment of croupous pneumonia; but I am convinced too much attention has been given to the matter and the patient's condition rendered more perilous by overfeeding and misuse of stimulants. We have to note in the first place that there is not only no appetite, but a complete disgust for food when offered. Usually we find that which our French *confrères* call a saburral state of the mucous membrane of the stomach, in which a tenacious, gray mucus lines this viscus, the tongue is heavily coated, the breath foetid, and the excretions diminished. To force on the unwilling stomach a quantity of food and stimulants is to contribute to the distress and to lessen, rather than promote, assimilation. Large draughts of cold milk swallowed greedily because of thirst rather than for food, also discommoded the patient by pushing up the diaphragm against the laboring respiratory organs, and so much impinge on the solar plexus as to affect the heart through the ready reflexes proceeding from these nerves of animal and organic life. A course which seems to me far more useful than the usual conventional way of forced feeding was pursued in these cases. I am well assured that food should not be given more frequently than once in three or four hours, for the reason that this is the minimum time for the completion of stomach digestion. If fresh, bulky, and cold aliments be thrown into the laboring stomach when already occupied in digestion, the time and manner of the process are altered and become irregular, so that the peptones are not formed until the intestinal digestion is accomplished, and necessarily imperfect products result. Under such conditions the nutrition of the patient is not improved. I find it far better to give the proper foods at intervals of three to four hours, as I have stated, and the much-dreaded depression and failure of the vital powers have not been seen. Such simple aliments as milk, mutton or chicken broth, are the most suitable, and even these must not be forced on the patient too strongly. Let his own inclination have a voice in the matter, although the error of permitting a serious decline for lack of aliment must not be committed. When the time or character of the case presages a decline in the vital forces, stronger aliments and a moderate amount of stimulant will be necessary. I have used whenever the patient's tastes allow, egg-nog fortified with whiskey or brandy to the extent of one to four ounces in twenty-four hours, and have not gone beyond this. In the four cases here narrated no more stimulant

or stimulating food were found necessary than the egg-flip during the period of maximum depression.

I must now narrate the cases, four in number, on which these observations are based. One swallow does not make a summer, nor do four cases of pneumonia settle the questions connected with its treatment; but they surely afford valuable indications.

Three of these cases succeeded to influenza, and one occurred anteriorly to that epidemic.

CASE I. was that of a pharmaceutical manufacturer, a man of about fifty-four years, medium height, slender, and inheriting the tubercular constitution, but he has gone on through life successfully without serious impairment of health at any time. He came home from his club late on a certain Saturday night, or rather about 2 A. M. on Sunday morning, and went into a warm bath, where, it appears, he fell asleep, and continued so until aroused by his wife who became alarmed at his protracted stay in the bath-room. He had a violent rigor on awakening and high fever succeeded to the chill. Throughout the next day he had much fever, pain in his right chest, considerable embarrassment of breathing, cough bringing up some blood and mucus. I saw him on Monday, when his symptoms continued as already described, he was very restless, had a temperature of 104° F., pain in the right side, catching respiration and cough, with the characteristic sputum of croupous pneumonia. His eyes were brilliant, his face flushed, and his expression anxious.

The whole inferior lobe of the right lung and the adjacent pleura and part of the middle lobe were consolidated and presented the usual physical signs of that condition. Bronchitis was universal. The action of the heart was rapid, but well sustained. Six leeches were applied to the chest, allowed to fill and fall off, and a powder containing three grains of calomel was given. A teaspoonful of paregoric at intervals was advised for the cough. Much relief was experienced when the calomel acted; the skin, previously dry, yellow, almost jaundiced, grew moist and lighter in color, and the general distress was notably lessened. On the following day the temperature continued high (103.5° F.), and delirium was observed at night. For the cough, especially, ethyl iodide by inhalation was ordered, and chloral was prescribed to procure sleep at night. These remedies were continued to the period of crisis on the seventh day, crisis or lysis being the mode of cessation of the pulmonary inflammation, and the beginning of convalescence, as all the world now knows.

I need not take up time and space with the giving of every detail. It will suffice to say that the inhalant was continued up to the end of the case; calomel was given twice, and the chloral to remove the delirium and procure sleep for six days—the dose being twelve grains.

The crisis occurred on the seventh day, and although the convalescence was rather slow, it proved to be complete, and the patient was restored to health, becoming stronger and stouter than ever before.

CASE II. occurred in a gentleman seventy years of age, of rather feeble health. He was a professor in a public institution and had always led a sedentary life. He had an attack of the prevailing influenza, and as this was about to cease he began to have distress of breathing, pain in

the side, and characteristic rusty sputa with a less viscid fluid composed of mucus and blood like ordinary "prune-juice" expectoration.

As the patient had had several attacks of pseudo angina pectoris, and irregular action of the heart, I much feared the results of the new seizure. He did surprisingly well. Lysis—not a severe one—began on the fifth day, and convalescence immediately set in. Notwithstanding his age and apparent feebleness he took but little aliment, which was first of milk and afterward reinforced with some mild egg-nog. He had a three-grain dose of calomel—only once—ethyl iodide was regularly inhaled, and a teaspoonful of paregoric was given occasionally to moderate the cough.

Like the other two cases to be narrated presently, this patient had not recovered from his attack of influenza when the pulmonary inflammation began, and the characteristics impressed by the epidemic on the pneumonia in no way lessened the severity of the disease. I have little doubt that this so-called sequela is really one element in the morbid complexus—just as much necessary to the full picture of the malady as the catarrh of the nares and fauces.

The third case occurred in a gentleman from the South, an ex-governor, a member of congress, and an active politician. He was then fifty-six years of age, very stout but flabby, got out of breath on slight exertion, and there was much irregularity of the heart's action. It was for this condition of his heart that he came to consult me. The influenza epidemic was then at its highest, and in a few days he became ill with a well-defined attack. Pulmonary troubles quickly ensued, and a considerable extent of the right lung—all of the lower lobe—became consolidated. The temperature ranged between 102° and 104° F. He had mild delirium at night and some confusion of mind during the day. His cough was troublesome and the expectoration was of the "prune-juice" variety, with, however, some characteristic sputa of croupous pneumonia. The attack terminated by lysis beginning on the seventh day, and was marked, also, by some critical phenomena, as a profuse diarrhœa coming on suddenly. His recovery proceeded rapidly after this occurrence and no sequela remained.

The patient was treated on the same general plan as the other cases, and I need not, therefore, enter into details on this point.

The fourth was the most formidable of the series. A lady of sixty-four years, stout, even obese in body, and a victim of chronic malarial poisoning, was attacked in New York with the prevailing influenza, and having been a patient of mine in former years came to Philadelphia to be under my care. She was then suffering with the local symptoms in a severe form. In addition to the acute catarrh of the broncho-pulmonary mucous membrane, Mrs. S. suffered extremely from an acute catarrh of the left middle ear. This caused rupture of the drum at an early period—fortunately—and an enormous discharge of a sero-purulent and mucous fluid occurred up to the end of the disease. On the night of the second day after her coming to Philadelphia she had the

usual violent rigor, followed by a pneumonia involving the lower lobe of the right lung and nearly half of the middle lobe. An extensive bronchitis, including the larger divisions of the tube, accompanied or rather preceded the lung inflammation and added to the distress of breathing, at the same time causing a most frequent and painful cough. The ethyl iodide gave great relief to the cough, and as in the other cases, seemed to modify the usual complexus of pneumonia, lessening the violence of the symptoms, and promoting a favorable termination by lysis. The usual effects of calomel on the symptoms referable to the liver, were results of its administration in the three-grain dose, and the diuretic and diaphoretic action were very decided also.

None of these cases left any after-trouble, although Mrs. S. had some highly significant symptoms of the chronic malarial toxæmia, from which she was not free when she went into the influenza. This manifested its usual tertiary tendency, but the more decided antipyretic doses of quinine quite failed to "break up" the seizures. Then I resolved on the administration of pilocarpine, and had results therefrom quite happy and unexpected—for although it has been given to arrest intermittent fever, the use and effects were restricted to the substitution of the sweating for the chill-stage. In such instances the agent was supposed to have a curative effect, by suppressing the other stages; but in the case under consideration the remedy was employed as the one suitable to arrest the whole morbid process. The pilocarpine was taken at night on retiring, for several weeks, and the usual salivary and cutaneous flow took place. The result was, the patient experienced no depression of the vital powers, had an excellent night's sleep, and on the following day was in good condition throughout, the manifestations of malarial toxæmia having wholly ceased after the medicine had been administered for a week.

The influenza pneumonia was not a typical pneumonia—and it varied from the normal type in several directions. The termination in favorable cases was by lysis and not by crisis; the febrile process was in a less active form; all the physical and rational signs were much less pronounced, but the mortality was larger—the mode of dying being by heart-failure.

The treatment of pneumonia as above outlined is submitted to my colleagues of the medical profession with a view to further clinical observations. My own experience, although so satisfactory, is on too limited a scale to justify a final conclusion in regard to the real value of the plan. Many cases in the hands of physicians living under the most varied conditions must be treated in the way proposed if an accurate judgment is to be finally rendered.

PRESYSTOLIC APEX-MURMUR DUE TO AORTIC REGURGITATION.

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CASE I.—Henry H., aged twenty-one years, was admitted into St. Mary's Hospital, under the care of Sir E. Sieveking, on April 30, 1887, suffering from extreme anæmia after severe and repeated epistaxis. The notes of his case were taken by Mr. O. E. Higgins, M.A. He had had chorea nine years before, and rheumatic fever six years before; he was then told that his heart was affected. After his recovery he seemed in good health and was able to work hard; for ten months he worked as a navvy on a railway in Canada. During the last two years he had been a French polisher, and had found no difficulty in doing his work until lately. Seven weeks before admission, while polishing a floor on his knees and with his head low, his nose began to bleed. This continued for nine hours, and it had frequently recurred for short periods. Of late also there had been a little shortness of breath. On admission, he was found to be very thin and extremely pallid. Pulsation was visible in all the superficial arteries. Pulse 100, sudden, forcible, collapsing. The area of cardiac dulness was much increased, and the impulse diffused and visible. Four murmurs could be heard: at the base a systolic and a loud diastolic, at the apex a *presystolic* and a systolic. The liver was enlarged, the urine albuminous with hyaline casts and a trace of blood. The lungs were normal. Temperature ranged between 98.4° and 99.8°.

A few days later it was noticed that the *presystolic* murmur occupied a considerable part of the diastole, and became of a higher pitch at the end, running up into the systole. But on May 9th it was recorded that "the *presystolic* murmur observed for several days cannot be distinctly made out to-day," though the aortic murmurs were loud. On the same date the spleen was felt, just below the margin of the ribs, and some fine crackling sounds could be heard in the left lower axillary region: the patient had complained of a sudden sharp pain in this region the day previously, and the temperature had risen to 101°. The urine was pale, clear, acid, of specific gravity 1012; it contained albumin, granular and blood casts, and blood-corpuscles, though not in sufficient amount to color it. Next day (May 10th) a very large increase of the splenic dulness was noted, and the spleen was felt below the ribs, its lower limit being one inch above the level of the umbilicus. The *presystolic* murmur was still absent, and the systolic mitral had developed a distinctly musical character which it had not possessed before. But on the 11th the *presystolic* was again detected, and on the 19th it was distinct, while the systolic had vanished, the first sound at the apex being now short and sharp. Another attack of pain in the left side had occurred and the spleen was larger.

I first saw the patient on May 23d, on succeeding Sir E. Sieveking in charge of in-patients. There were then a double aortic and a *presystolic* mitral murmur, but the systolic mitral murmur could not be heard.

The first sound was short at the apex, the second absent. The treatment consisted of 15-grain doses of sulphocarbolate of sodium every four hours, and this was continued. A few purpuric spots developed on the patient's legs, but on the whole his condition gradually improved; the epistaxis ceased to recur, his strength increased, and at the end of June he was so much better that he was allowed to be up. The improvement continued and on July 10th he was permitted to go home.

On July 27th he was readmitted on account of recurrence of epistaxis. On August 1st I made the following note: "Heart's impulse wavy and diffused over a wide area, most marked about three fingers' breadth below and two to the outer side of the nipple. No thrill, but over the apex-beat there is a well-marked presystolic murmur continued to the systole; this cannot be heard to the right of the nipple-line. At one point, just outside the impulse, a presystolic murmur and first and second sounds can be heard. Further to the left no murmur is audible, but a short forcible first sound followed by a second. The aortic diastolic murmur is loud at the base and is conducted downward more toward the apex than down the sternum; it is audible nearly to the nipple-line, but is not audible at the xiphoid. Pulse highly characteristic of aortic regurgitation." On the evening of this day he had another sudden attack of pain in the splenic region. A week later I noted that "the aortic diastolic murmur can be traced obliquely downward to the fifth rib, about one finger's breadth to the inner side of the nipple-line, and immediately below this the presystolic murmur commences."

He was again treated with sulphocarbolate of sodium, and with dialyzed iron, but his strength gradually failed. Recurrence of epistaxis, diarrhoea, and increasing feebleness brought the end on September 4th.

The post-mortem examination was made the next day by my colleague, Dr. Maguire. The pericardium was adherent to the heart throughout by fibrous bands, and some similar bands passed from the front of the pericardium to the under surface of the ribs. The heart was much enlarged, especially the left ventricle. *The mitral orifice admitted three fingers, the tricuspid four.* All the cavities contained post-mortem clot, and adhesive ante-mortem clot was also found in the right auricle and in both ventricles. The pulmonary and tricuspid valves were normal. On the right posterior cusp of the aortic valve and immediately below it were fresh vegetations with ulcerations. All the cusps were thickened from old endocarditis. Below the anterior cusp was a large vegetation of fibrin adherent to a roughened inflamed surface of endocardium apparently not ulcerated.

The mitral valve-flaps were similarly thickened, and on the auricular surface of the anterior flap at its middle portion, and also on the chordæ tendineæ were patches of recent endocarditis without ulceration. The lungs were congested and œdematous. There were some old fibrous adhesions at the base of the left pleura. Liver large and firm. Spleen much enlarged, weighing fifteen ounces, its surface mottled with small white spots. It contained a yellow infarct of the size of a walnut. Both kidneys also contained small infarcts.

As this patient died during my autumn holiday, I was not present at the autopsy. Nine months later, however, I discovered that the heart had been preserved for the Museum, and had an opportunity of exam-

ining it with Dr. Maguire. The weight of the heart was now fifteen and a half ounces. We found that at this time the mitral orifice would not admit more than *two* fingers, and that with some little difficulty. Dr. Maguire, however, felt confident that the post-mortem record was correct, and that at the time of the autopsy the orifice admitted three fingers. Thinking that possibly the action of the spirit in which the specimen had been preserved for nine months might have caused some contraction, we examined another heart in the Museum, taken from a case of aortic aneurism with normal mitral flaps. In this case, the left ventricle being large, it is probable that the mitral orifice may have been somewhat dilated during life, yet we found that now after having been preserved in spirit, the orifice would not admit more than two fingers comfortably. It therefore seemed likely that in the other case there had been little or no stenosis, and that the post-mortem record was correct.

CASE II.—James B., aged thirty years, admitted into St. Mary's Hospital under my care, October 10, 1889, suffering from dyspnoea and ascites. He was found to have a very large heart; the impulse could be felt four fingers' breadth below and five fingers' breadth to the outer side of the nipple in the anterior axillary line.

The cardiac dulness was extensive also in the upward direction, and involved even the manubrium and the first and second intercostal spaces at the left margin of the sternum. A loud, rough, systolic murmur was heard over the whole of this basic area, and in the second right interspace close to the sternum a very local, short, diastolic murmur was detected. In addition, the pulse-wave in the left radial artery was always smaller than that in the right. These symptoms had led to a diagnosis of aortic aneurism before his admission. Not the slightest pulsation, however, could be seen in the upper part of the thorax, and I was decidedly of opinion that the case was essentially one of aortic regurgitation. At the apex a double murmur was audible, which varied in character on different occasions. Sometimes it was systolic and diastolic, *at other times it was distinctly presystolic and systolic*. I noted, however, that the *presystolic* murmur when it occurred, was of a blowing not rumbling, character, and was short. At the xiphoid a tricuspid systolic murmur could be heard. The patient suffered from ascites and flatulence. The liver was enlarged, its edge reaching four fingers' breadth below the costal margin; it was firm and tender. Not much œdema of the legs. Urine of sp. gr. 1024, albuminous. The patient stated that he had never had rheumatic fever, though he had been troubled occasionally with "rheumatic pains." On the 26th of October he suddenly fell back dead.

At the autopsy it was found that the heart was very large, weighing thirty-five ounces with the contained clots, twenty-seven and a half ounces without them. The aortic valves were fused into a calcareous, rigid mass, occupying fully three-fourths of the orifice. An aperture of about the diameter of a cedar pencil remained; it was situated in the left half of the normal position of the orifice, so that the stream of blood regurgitating through it must have impinged on the anterior flap of the

mitral. *The mitral orifice admitted three fingers readily*, the flaps were healthy except for a very little atheroma of the base of the anterior one; they were not shrunken or deformed. The tricuspid and pulmonary valves were normal. Liver, nutmeg and fatty. Kidneys of normal size, capsules slightly adherent. About two inches of each radial artery was excised; they were equal in size, but while the vessel from the right side was normally round, that from the left side was distinctly flattened, as if it had long been only partially filled. It appeared that this must have been due to the aortic stenosis, the onward current of blood being directed mainly toward the innominate artery.

CASE III.—William M., aged thirty-one years, admitted into St. Mary's Hospital October 22, 1889. He had never had rheumatism. Twelve years ago he had a chancre and buboes. Three months ago he began to have pains in his stomach, worse after meals, and shortness of breath after exertion.

On admission there was orthopnoea, throbbing of carotids, yellowish complexion, much dropsy of legs and scrotum, and much albumin in the urine. Respirations 36; lungs normal, except for some moist sounds at the bases. The cardiac dulness was very extensive, from the right margin of the sternum to the left anterior axillary fold. The cardiac impulse was diffused, being seen and felt in the fifth and sixth inter-spaces, from one inch on the inner side of the nipple-line to two inches on its outer side. At the base a double murmur was heard, the systolic being conducted upward, the diastolic downward along the left side of the sternum, and loudest in the third space. At the point of maximum impulse, in the sixth space, two inches outside the nipple-line, systolic and diastolic murmurs could be heard, but to the inner side of the nipple-line, less than an inch below the nipple, and the same distance to the right of it, *a distinct presystolic murmur was heard. It was decidedly rumbling in character, but it did not increase in intensity toward its close, and did not run into a "snap."* This presystolic murmur was not invariably present, but it was heard three times at least during the twelve days during which he was under observation.

Pulse 108, somewhat collapsing in character, not full between the beats, and quite small in size. From this smallness of the pulse and the presystolic murmur I thought it probable that there really was mitral stenosis in this case as well as aortic incompetence, but the autopsy showed that the smallness must have been due to mitral regurgitation. Four days before death it was reported that his urine was of specific gravity 1015, free from albumin. He died November 3d.

Post-mortem: Heart very large, weight, thirty-five ounces; all the cavities dilated. Muscular tissue of heart normal in color, thickness, and consistency. *The mitral orifice admitted five fingers*; the mitral flaps normal, chordæ tendinæ normal. Aortic valves incompetent, cusps slightly thickened, but not much deformed. Aorta highly atheromatous in patches just above the aortic valves. Tricuspid normal. Pulmonary valve had only two cusps, but was otherwise normal. The lungs contained large hæmorrhagic infarcts in the lower lobe of each and the right middle lobe. Kidneys enlarged, each weighed ten ounces, capsule normal, surface smooth and pale. Liver enlarged (five pounds, one ounce), section fatty and nutmeg. Spleen, seven ounces, normal.

CASE IV.—William B., aged forty-five years, admitted into St. Mary's Hospital May 13, 1890. He had never had rheumatic fever. Stated

that he had not taken much alcohol, and that he had never had syphilis. His first symptom was swelling of the feet five weeks before admission. Dyspnoea had been present only for one week. On admission there was some orthopnoea. Pulse 100, collapsing, yet the vessel remained distended between the beats. The cardiac dulness extended to the nipple-line, impulse feeble. At the base a double murmur—systolic loud, diastolic not loud, and heard best in the fourth left interspace. The second pulmonary sound was accentuated. *At the spot where the apex-beat should normally be found there was a presystolic murmur, not long, but of a definitely "cantering" character. This murmur was very local; a little way to the left of this site it vanished, and a systolic blowing murmur became audible.* Liver much enlarged; no ascites. Catarrhal sounds generally over the lungs. The patient died six days after his admission.

Post-mortem: Heart weighed nineteen ounces. Left side empty. Right auricle not distended. Aortic valves quite incompetent and much diseased; the anterior and right posterior cusps were united along their margin, so that the regurgitant stream must have been directed toward the mitral valve. All the cusps were covered with warty vegetations, with some ulceration. *The mitral orifice admitted four fingers; the tricuspid five fingers.* The anterior flap of the mitral and its chordae tendinae were thickened, but not shrunken; the posterior flap was very slightly thickened. The pulmonary and tricuspid valves were normal. The spleen and kidney contained infarcts.

It was stated some years ago by the late Dr. Austin Flint, of New York, that in certain cases of aortic regurgitation a presystolic apex-murmur might exist without any stenosis of the mitral orifice. This statement has not met with much acceptance, and no reference to it is made in the latest edition of the text-books on medicine. In the interesting discussion on the "presystolic murmur, falsely so called," initiated by Dr. Dickinson in the columns of the *Lancet* in October, 1887, and carried on by Dr. Bristowe, Professor Gairdner, and many other distinguished physicians, it was assumed on both sides that whatever might be the true rhythm of the murmur in question, it is at all events pathognomonic of mitral stenosis. Even Dr. Gairdner only inserted in a foot-note the following rather sceptical reference to Dr. Flint's claim: "I will observe a similar reserve as regards Dr. Austin Flint's curious but exceptional experience of a murmur, apparently of mitral stenosis, going along with free aortic regurgitation, and with an uninjured mitral valve and orifice." Since that time, however, Dr. Gairdner has published in the *AMERICAN JOURNAL OF THE MEDICAL SCIENCES* for August, 1889, a case which supports Dr. Flint's view, for the autopsy showed that aortic incompetence was present, and Dr. Gairdner's statement implies that the mitral was normal, though he does not expressly say so.

In the *Medical Chronicle* for June, 1890, my colleague, Dr. Maguire, has given a summary of the cases supported by post-mortem proof of non-contracted mitral which have thus far been published. They are

nine in number—three by Flint, two by Guit ras, one by Steell, one by Gairdner, and two by Osler. He adds a detailed account of two cases, one of his own and one which was under my own care, and in which he made the post-mortem examination. In the former, a typical case of aortic regurgitation, *“about one inch inside and a little above the apex-beat, there was heard a presystolic murmur, not rough, but rather blowing, distinctly separated from the second sound, and terminated by a normal first sound. The murmur was heard over only a limited area. . . .* The presystolic murmur remained for a week, and was distinctly heard both by my colleague, Dr. Cheadle, and myself. The autopsy showed that the heart was greatly enlarged, weighing twenty-two ounces. All its cavities were dilated. The aortic valve was markedly incompetent; its cusps much thickened and shrunken. The thoracic aorta was extremely atheromatous and thickened. *The mitral orifice admitted easily three fingers.* The anterior flap was slightly thickened, and while its auricular surface was smooth, its ventricular surface was very slightly roughened. The posterior flap was normal, and the chord  tendin  were neither thickened nor shortened.

The second case was one of great pathological interest, and I therefore quote Dr. Maguire’s account of it in full :

H. S., aged fifty five years, was admitted into St. Mary’s Hospital on October 21, 1887, under the care of Dr. Lees, who has kindly given me permission to make use of the case. He had never had rheumatism, had lived in London all his life, and had drunk spirits and beer to excess. He had suffered for four or five months from dyspepsia and pains in various parts, and these had increased up to the time of admission. Suppressing the immaterial details, I may relate that on examining the heart there was seen a very diffused apex-beat, but the true apex seemed to be in the fifth interspace slightly outside the nipple-line. There were evident signs of cardiac dilatation affecting both the right and the left sides. At the aortic cartilage the first sound was weak, the second accentuated. At the fourth left interspace, near the sternum, was heard a diastolic murmur carried downward to the ensiform cartilage. *Just below the nipple a short presystolic murmur was heard*, blowing in character, and heard not quite so distinctly at the cardiac apex. The pulse was collapsing and short, and capillary pulsation was very evident. On October 26th it was noted that the presystolic murmur was much rougher in character; that it led up to the first sound, and that it was now heard two fingers’ breadth outside the nipple. On October 29th no presystolic murmur was heard. In the nipple-line there was found a sharp first sound, a short systolic murmur, and a short diastolic murmur. On October 31st in the fourth left interspace near the sternum, a short systolic and a rather long diastolic murmur were heard, but no presystolic murmur was found anywhere. At the cardiac apex there was a short systolic murmur carried for a little distance into the axilla. On November 7th the diastolic murmur was conducted down to the apex. *Thus, while the main signs of the case were those of aortic regurgitation, a distinct presystolic murmur was heard for a short time near the cardiac apex.* I made an autopsy upon this case and found the heart greatly enlarged, weighing twenty-five and a half ounces, the enlargement being the more marked in the left ventricle. The aortic valves were incompetent and showed advanced atheroma, which had produced great shrinking of the segments. The sinuses of Valsalva above the right and anterior aortic segments were much pouched, and the artery around them was in an

advanced state of atheroma. In the wall of the posterior sinus of Valsalva an opening which admitted easily the little finger represented the orifice of the left coronary artery. The artery beyond this was transformed into a calcareous tube, somewhat larger in diameter than the opening mentioned by which it communicated with the aorta, and lay in the auriculo-ventricular groove until the anterior sulcus between the two ventricles was reached. Here the aneurism, for its nature was evident, ended by dividing into the ordinary branches of the coronary artery, which appeared to be of normal size and structure. The aneurism bulged, on its inner aspect, into the cavity of the left auricle above the anterior cusp of the mitral valve. The bulging at this spot somewhat diminished the calibre of the auricle, but it seemed to be quite clear of the cusps of the mitral valve and of the auriculo-ventricular orifice. The aneurism was empty. *The mitral orifice admitted three fingers easily.* On the anterior cusp of the mitral valve there were seen a few scattered patches of atheroma, but otherwise no abnormal appearance was noticed, and the chordæ tendinæ were healthy. All the cavities of the heart were dilated. Here, then, we had, in addition to the lesion of the aortic valve which caused its incompetence, an aneurism of the left coronary artery which caused a projection into the left auricle. Yet I think, on careful examination of the specimen, that this latter lesion could not in any way interfere with the flow of blood through the mitral orifice. Moreover, the extent of the projection could be well judged after death, for the extreme calcification of the aneurism would entirely prevent any further expansion of the vessel during life. The case seems to be truly a companion to that previously described, and thus we have two examples of presystolic murmur without mitral stenosis, and apparently the result of aortic regurgitation."

I entirely endorse Dr. Maguire's description of this case and his remarks upon it.

Adding these two cases to the four which I have above narrated, and to the nine mentioned in Dr. Maguire's paper, we have fifteen cases by various observers in which a murmur of presystolic rhythm has been heard in cases of aortic regurgitation in which it has subsequently been proved by autopsy that no stenosis of the mitral existed. Cases without autopsy are of course worthless as proof, but they may be referred to as illustrations. Dr. Maguire quotes one of his own and another of Dr. Bramwell's, in which a presystolic murmur existed in a case of aortic regurgitation believed to be free from mitral stenosis. I have such a case under my care at present. It is a case of severe aortic regurgitation in a man of twenty-six, in which there is a typical double murmur at the base and also a rather loud systolic followed by a short diastolic at the apex. He has frequent anginal attacks. On several occasions I have heard a faint presystolic murmur to the inner side of the apex-beat, and a few days ago I noticed that it was distinctly present after the slight exertion of taking off his shirt, but that in a minute or two the rhythm changed into systolic and diastolic. On making him sit up in bed the presystolic murmur reappeared, to vanish again after a minute or two. I think it is reasonably certain that this patient has no mitral stenosis.

I have said above, "a murmur of presystolic rhythm," for it must be confessed that it does not usually simulate very closely the rumbling, can-

tering sound of the murmur of mitral contraction. It is usually short and rather blowing in character. But it may partake somewhat of the well-known quality, and in Case III. this circumstance, conjoined with the smallness of the pulse, led me to diagnose a stenosis which the post-mortem examination proved to be absent. In Case I. the presystolic murmur was long and quite typical, and was even reported to have been accompanied by a thrill (this, however, was not present while the case was under my own observation). It is unfortunate that in this case the condition of the heart nine months afterward threw some doubt on the accuracy of the record of the post-mortem examination. But if any stenosis existed, it must have been very slight, and the aortic regurgitation gave rise to the most extreme and characteristic symptoms. In the light of the other cases I have no doubt that the presystolic murmur was in great part, if not entirely, due to the aortic regurgitation. It is worthy of note that in this case there was a large vegetation below the anterior cusp of the aortic valve and vegetations also on and below the right posterior cusp; hence the regurgitant stream was probably mainly directed toward the left, and it would therefore strike the anterior mitral flap. Similarly, in Case IV., the anterior and right posterior cusps of the aortic valve were actually united along their margin, leaving the left half of the orifice alone patent, and in Case II. the pathological process had gone on to completely calcified union of the cusps, leaving again as patent opening only the left portion of the normal orifice. Hence, in all these three cases the regurgitant stream must have impinged on the anterior mitral flap, and there is no difficulty in seeing how this flap was in consequence thrown into vibrations when it was carried outward by the incoming current through the mitral orifice at the end of the diastole. For, "in full diastole" (to quote Dr. McAlister's account of the observations of Ludwig and Hesse, *British Medical Journal*, 1882, vol. ii. p. 825), "the flap and its cords are stretched aslant across the cavity. . . . The flap does not hang loosely down; it is stretched taut from basal ring to muscle-tip." Hence under the influence of two independent blood-currents impinging on its opposite sides vibrations are easily produced and give rise to a murmur during the ventricular diastole, more especially during its closing period, which corresponds with the systole of the auricle.

THE THEORY OF PYREXIA.

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DURING the last ten years much importance has been attached to the part played by the nervous system in the production of pyrexia. Many

observers have put upon record cases in point. Six years ago I published several such,¹ and have since, from time to time, mentioned others.² In America³ Ott has given the profession some valuable material bearing on this question. Several experimenters have proved that in animals injuries of the nervous system will produce a rise of temperature, and in a recent paper⁴ I have given references to all these experiments, and have shown that lesions of the corpus striatum and optic thalamus will, in rabbits, cause a great rise of temperature quite apart from the influence of the anæsthetic and the operation, but that lesions of the neighboring white matter probably do not influence the temperature. Dr. Goodhart⁵ has published cases which he calls examples of innominate fever, and which he suggests are due to a functional disturbance of the cerebral heat-regulating mechanism, and I have recorded⁶ some similar cases under the name of inexplicable pyrexia, and have also published an example of hysterical pyrexia.⁷ In an article⁸ on the neurotic theory of pyrexia, I tried to show that all pyrexia must be either primarily neurotic—that is to say, due to a lesion of the central nervous system, or the paths from it to the muscles, which are the chief thermogenetic tissues, an instance of this variety of pyrexia being that which is sometimes found associated with tumors of the brain; or it must be due to a reflex affection of some part of the heat-mechanism, probable instances of this are the rise of temperature produced by a small tense abscess, and that sometimes induced by the colic due to gall-stones; or it must be due to the stimulation of the nervous heat-mechanism or the muscles by the circulation of some poisonous products through them or through some part stimulation of which affects them reflexly. An instance of this form of pyrexia may be the rise of temperature which accompanies zymotic diseases and belladonna-poisoning; and possibly, also, sometimes the poison acts on some part of the thermolytic mechanism. In 1887, Dr. MacAlister, in his *Gulstonian Lectures*,⁹ fully endorsed the view that the nervous system controls pyrexia. He pointed out that the mechanism probably consists of three parts. They are a heat-loss or thermolytic mechanism acting chiefly through the skin by the cutaneous vessels and sweat-glands; its centre is in the medulla; a heat-production or thermogenetic mechanism which consists

¹ Guy's Hospital Reports, vol. xlii. p. 49.

² Lancet, July, 1885, June, 1889.

³ Therapeutic Gazette, September 15, 1887; Brain, 1889; Journal of Nervous and Mental Diseases, 1884 and 1887.

⁴ Journal of Physiology, vol. xi., No. 1.

⁵ Guy's Hospital Reports, vol. lxx. p. 379.

⁶ British Medical Journal, 1886, vol. xi. p. 1096.

⁷ Clinical Society's Transactions, vol. xix. p. 124.

⁸ Practitioner, January, 1886.

⁹ The Nature of Fever, 1887.

of (a) the muscles in which the greater part of the heat of the body is produced, or (b) that part—probably the corpus striatum—of the cerebral nervous system which controls this function of the muscles, and of (c) nervous paths connecting these two parts. Lastly, a thermotaxic mechanism, whose office is to adjust the balance between the other two; the seat of this mechanism must be in the nervous system, but its precise position is unknown.

Dr. MacAlister, toward the end of his lectures, observed that the thermotaxic mechanism was almost certainly the last of the three to be evolved, therefore it is the most difficult to localize. It is very elementary in children, and hence the frequency with which in infants slight causes produce considerable pyrexia, and it is easily disturbed through a wide range, as we see in hysterical pyrexia. The thermolytic is the first to be developed. It is well organized, and definitely localized in the vasomotor, respiratory, and sudorific centres; even cold-blooded animals have a thermolytic mechanism. The thermogenetic mechanism is developed after the thermolytic; it is fairly definitely localized, and is first met with well developed in warm-blooded animals. The nervous heat-mechanism, therefore, follows the law of evolution, consisting, as it does, of the passage from the most to the least organized—that is to say, from the lowest well-organized centres up to the highest least-organized centres. The order of organization is like that of evolution—thermolytic, thermogenetic, thermotaxic. Fever, MacAlister looks upon as a dissolution—first, of the thermotaxic, then of the thermogenetic, and lastly, of the thermolytic mechanisms; and he considers that during recovery, first the thermotaxic, then the thermogenetic, and finally the thermolytic recovers.

The above abstract, I think, fairly represents our certain knowledge, and also the modern theory of pyrexia. I propose now to indicate some facts which support this theory, and to examine those that have been urged against it.

The above theory of the evolution of the heat-mechanism supposes the thermolytic is much earlier evolved in the animal scale than the thermogenetic mechanism, and this is supported by the fact that cold-blooded animals are much lower in the animal scale than warm-blooded; for, as warm-blooded animals have to maintain a fairly constant temperature however cold their surrounding medium, we should expect that they would have a much more potent heat-producing mechanism than animals whose temperature fluctuates with that of their environment. It struck me that if the corpus striatum presides over heat-production it ought to be much larger in warm-blooded animals than in cold. I referred to the text-books on comparative anatomy, and although the information is scanty, it appears that this body is small in fishes and amphibians, is larger in reptiles, and becomes much bigger in birds.

We thus see that, roughly speaking, the corpus striatum is smallest in cold-blooded animals and largest in warm-blooded. Further observations on the subject are required—perhaps it will be found that it is largest in just those reptiles, such as the *Python bivittatus*, which are warm-blooded. In birds it is especially large, and this is interesting when we bear in mind the high temperature they often maintain.

Again, if this evolutionary view be correct the thermotaxic mechanism should be better developed in man than in lower mammals. I made a series of observations upon the rectal temperature of twenty-seven rabbits, and found that quite commonly the temperature varied between 101° and 103° F., and in some few animals a little beyond these limits, so that we may fairly say that the range of normal rectal temperature in this animal is three degrees, a much greater range than in man. It seems rational to attribute this difference to the fact that probably in the rabbit the thermotaxic mechanism is not so well developed as in man.

Also, this evolutionary view appears to derive support from the action of drugs. The materia medica books all state that those drugs which increase the perspiration and dilate the cutaneous vessels, reduce the temperature. Such are alcohol, nitrous ether, and antimony; but every clinical physician knows that these drugs are most uncertain in their antipyretic action, and as a rule have very little effect. Drugs, however, such as quinine, antipyrine, etc., which certainly do not act through the thermolytic mechanism, and, therefore, must act upon one of the other two mechanisms, are powerful agents in reducing pyrexia.

Sawadowski states that antipyrine most certainly acts upon the corpora striata, for after the removal of these bodies in dogs its antipyretic effect could not be observed. If these experiments are confirmed, as, judging from other experimental work, they probably will be, we may conclude that antipyrine acts by diminishing thermogenesis. We, therefore, see that it is difficult to influence by drugs the earliest developed, the thermolytic mechanism, but it is comparatively easy to act upon those—the thermogenetic and thermotaxic—which are later developed. This, however, is nearly always the case with drugs. For example, the recently developed mental faculties are much more easily acted upon by alcohol than are the earlier developed functions, such as motion, respiration, etc.

Another fact in favor of this view of the order of evolution of the heat-mechanism is the circumstance that young children quickly become cold if artificial warmth be withheld. The difficulty of keeping infants born prematurely properly warm is well known, and it is not improbable that the *fetus in utero* is, until quite the late months of pregnancy, a cold-blooded animal depending for its warmth on the surrounding warmth; and this points to the order of evolution already mentioned.

Against the view that because the chief centres for the vessels of the

skin, for the sweat-glands, and for the respiratory movements, are in the medulla oblongata, and that therefore this part of the central nervous system presides over the thermolytic mechanism, it has been urged that some of the variations of temperature which are produced by cerebral lesions higher up may be due to altered thermolysis, because parts of the higher central nervous system have been thought to have some vasomotor influence, and because sometimes there is a unilateral altered secretion of sweat in ordinary hemiplegia. But it is to be remembered that the vasomotor effects of hemiplegic lesions are insignificant compared with the severe vasomotor disturbance which follows upon lesions of the medulla oblongata, or of the cord, or of the nerves below it; also, it must be borne in mind that alterations in the amount of sweat secreted, and in the degree of vascularity on the side of the body opposite the lesion in hemiplegia, are very rare, and when they take place they are usually slight. Then, also, if we imagine that the rise of temperature following lesions in the cerebrum is due to altered thermolysis, it is very difficult to explain the fact that a lesion of the cerebrum will in a rabbit sometimes produce a rise of several degrees in the rectal temperature within an hour of the experiment, and after a few hours it may sink equally rapidly, for in animals thickly coated with fur alterations in the internal temperature of the body due to variations in thermolysis can only take place slowly. It is also possible that the rare vasomotor and sudorific effects of lesions above the medulla are not due to the direct influence of the higher nervous mechanism, but to a reflex affection of the vasomotor and sudorific centres of the medulla. We probably see instances of a reflex affection of these centres proceeding from the higher parts of the brain in the blushing from emotion and the sweating from fear that are so common. Lastly, we must bear in mind that there are several instances in which, although a certain part of the central nervous system has for its chief office the presiding over a certain function, yet it has some slight influence over functions which are chiefly supervised by some other part of the central nervous system. For example, the area of the cerebral cortex either side of the fissure of Rolando for the most part presides over the motion of the opposite side of the body, yet if it be damaged, there is some weakness on the same side of the body, and also some impairment of the sensation on the opposite side; these, and similar facts, seem to show that when we speak of having localized a function to a certain part of the brain, all we mean is that it is the part whose chief office is to preside over the same function. Looking at the question in this way it would harmonize with well-known facts to suppose that the cortex has some slight vasomotor and sudorific influence. We thus see that at least two other interpretations are possible of those facts which seem to show that the alteration in temperature which follows some lesions above the medulla may occur because the chief centre

for thermolysis is above the medulla ; and we also see that on the whole the evidence is greatly in favor of the medulla being the part of the central nervous system which presides over the loss of heat. Probably former writers did not pay sufficient attention to the frequency of respiration as a means of regulating the loss of heat, for many recent experimenters have shown that an increased warmth of blood leads by its stimulation of the medulla to an increased frequency of respiration, and a consequent increased loss of heat, and that this is one of the thermolytic mechanisms by which the temperature is maintained constant. The medulla has consequently been said to have a thermopolypnœic centre.

We now pass to the thermogenetic mechanism. Most observers who investigated the subject before 1886 came to the conclusion that in fever the heat-production was increased, but it must always be remembered that a patient's temperature is the balance between his heat-loss and heat-production, and therefore it does not by any means follow that when the temperature is raised the heat-production is increased. Since then this supposition has been confirmed, not only by calorimetical observations upon the limbs, such as those of Rosenthal upon the arm, but also by calorimetical experiments upon man. Ott put a man suffering from ague into a calorimeter, and showed that with the onset of pyrexia the production of heat was enormously increased, and Langlois has made over one hundred calorimetical observations upon children suffering from broncho-pneumonia and from varicella, and he also found the heat-production to be increased.

It is worthy of note that in just those two fevers in which high temperature persists longest—viz., typhoid and tuberculosis—the patients waste most, and this in spite of the fact that they are fed abundantly. I have often wondered whether this wasting of the muscles was the result of the very active thermogenesis that takes place in them. Sometimes the association between the wasting and the temperature is so intimate that it is very tempting to assume a close connection between them. To give an example: I saw a patient who had a high temperature as the result of an empyema. He wasted rapidly ; the pus was let out, the temperature fell, and he put on flesh at once. After some days the pus re-collected, the temperature rose again, and he began to waste visibly from day to day. The pus was let out for the second time ; again the temperature fell, and he put on flesh as quickly as he had lost it. Facts like these are very suggestive, and it is quite possible that some day they may be looked upon as a proof that the muscles are the chief thermogenetic tissues. It may, of course, be asked whether we ought not to get a subnormal temperature in diseases such as pseudo-hypertrophic paralysis, progressive muscular atrophy, and primary muscular atrophy, in which there is great muscular wasting ; but it must be remembered that we have very few records of the tempera-

ture of these diseases, that a diminished production may be compensated for by a diminished loss of heat, and also that it is well known in pathology that slow destruction does not abolish function to anything like the extent that a rapid destruction does. We do not know what chemical changes in muscle lead to the production of heat; perhaps the increased excretion of urea in fever has some bearing in this relationship. One cannot help noticing that in hydrophobia and tetanus, both of them diseases in which the motor function of the muscles is profoundly disorganized, the temperature of the body is also raised, occasionally in tetanus to a great degree. But it must not be supposed that this is an argument for supposing that the motor and thermogenic functions of muscle are the same. On the contrary, these diseases show that the opposite is the case, for they are both examples of disorders in which a considerable post-mortem rise of temperature may take place after all movements of the muscles have ceased. It is hardly possible that this could occur unless the production of heat continued after death; therefore in these maladies we have an instance of the continuance of one function of a muscle after the cessation of the other.

I have already alluded to the many clinical facts and to the experiments, several of which have been calorimetical, that have accumulated during the last few years, and which show that damage to the corpus striatum or to the optic thalamus increases the production of heat. Against this view it has been urged that it is extremely unlikely that two bodies, developmentally so different, should have a similar function; but probably this similarity is more apparent than real, for it is quite possible that a lesion of the optic thalamus may injure the tail of the caudate nucleus, or that part of the lenticular nucleus which lies to the outer and under part of the optic thalamus. The corpus striatum may developmentally be regarded as part of the cortex, and therefore it is reasonable to suppose that it, like some other parts of the cortex, has a localized function. The previous experiments in favor of its thermogenic function have been confirmed by those of Sawadowski and Ott, both of whom have shown that when putrid blood is injected into the veins it is impossible to induce fever if the corpora striata have been removed.

Whether it restrains or stimulates heat-production in health is at present a doubtful question; but the balance of evidence is that the corpus striatum is not inhibitory, for Messrs. Aronsohn and Sachs¹ found they could, by carefully stimulating it by an electric current, always produce a rise of temperature in the muscles and rectum. In these experiments the damage to the surrounding parts was very slight, and every time the current was passed the temperature rose. These results

¹ Pflüger's Archiv, 1885.

were published in 1885, and were quoted by Dr. MacAlister in 1887. In 1884, in my paper in the *Guy's Hospital Reports*, I argued that the thermogenetic centres were inhibitory in their action, and that when they were damaged the temperature rose because this inhibitory power was paralyzed. Since then a consideration of Messrs. Aronsohn and Sachs's experiments, of some of my own, and of fresh clinical facts, leads me to the conclusion that the hypothesis I put forward in 1884 was probably wrong, and that damage to the corpus striatum causes the animal's temperature to rise because the lesion irritates that organ. In favor of this view is the fact that a very small lesion of the corpus striatum will cause a considerable rise in temperature. I have seen a mere puncture in rabbits and a minute patch of softening of the corpus striatum in a human being cause a great rise of temperature, certainly suggesting that mere irritation will greatly increase the production of heat. On the other hand, both in artificial experiments and in the human subject, sometimes the destruction has been extensive and a high temperature has resulted; but it must not be forgotten that a lesion can hardly, unless it kill the animal or the patient, be sufficiently large to destroy the whole of the corpus striatum, and that if only part is destroyed the lesion will irritate the remainder. It is a remarkable fact, which I have often verified, that if in a rabbit a rise of temperature has been produced by a lesion of one corpus striatum, and after the temperature has fallen to normal the other corpus striatum is damaged, the temperature rises again, but it does not remain raised, but falls in a few days. This fact is strongly in favor of the view that the lesion causes a rise of temperature by its irritative effects. I have recorded the case of a child, in whom the temperature was raised often to a great height at frequent intervals for many weeks. At the autopsy the only lesion discoverable was a minute patch of softening in each corpus striatum, which might very well have been a powerful irritant, but certainly destroyed very little of these bodies.

Whilst there is thus a good deal of sound evidence, both experimental and pathological, of the locality of those parts of the nervous system which preside over thermolysis and thermogenesis, we have no certain knowledge of the position of the thermotaxic part which in health maintains the balance between these two, but no evidence has been brought forward to show that it is improbable that any part of the central nervous system has a thermotaxic function. There is, however, clinical evidence of the existence of this function, for although a few years ago those who talked of hysterical pyrexia were often laughed at, now its existence is allowed, and a description of it has crept into two English text-books—viz., Dr. Payne's *General Pathology* and Dr. F. Taylor's *Practice of Medicine*—and it is probably an instance of a disturbance of the thermotaxic mechanism. The chief reasons for this view

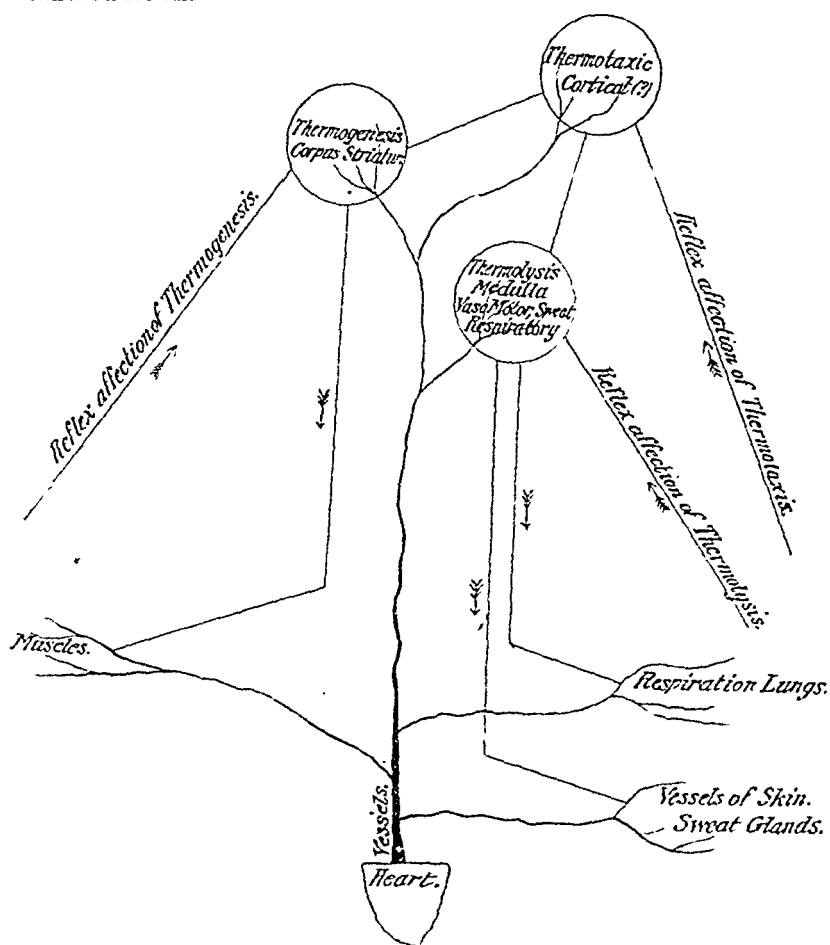
are the extreme and sudden irregularity of the temperature—often it will vary several degrees in an hour; its great height, a height which would probably be fatal if caused solely by an increased production of heat; the fact that it may be very high without the usual accompaniments of a high temperature; and, lastly, the circumstance that the latest evolved mechanisms are on the whole more likely to be upset functionally than are those which are more fixed. It is often the case, that in diseases in which the temperature has ranged high, shortly before death it runs up abnormally high. This is possibly evidence of the existence of a thermotaxic mechanism, for one cannot help suspecting that this mechanism which has been struggling hard to maintain the balance between the heat-production and heat-loss suddenly becomes paralyzed from overstrain, and the temperature at once rises. Rheumatic hyperpyrexia is probably another instance of disorganization of the thermotaxic mechanism.

Our knowledge of the position of this mechanism is very scanty; probably, as it is functionally and developmentally higher than thermolysis and thermogenesis, its seat is anatomically higher, and therefore we should look for it in the cortex. If this is so, it may explain the rise of temperature which many observers, such as Landois, Wood, and Ott, have obtained in experiments upon the cortex. The latter observer is definitely of opinion that the cortex in the region of the fissure of Rolando contains thermotaxic centres, but he also believes that there are some at the base of the brain.

I know of two cases which afford support to the view that the thermotaxic centre is cortical. One¹ has been already published. It is the case of a man who shot himself in the head with a bullet, and was admitted into the hospital unconscious. The bullet was immediately extracted. The temperature after the operation was 99.2° ; four hours afterward it had mounted five degrees, to 104.2° . It remained high till the patient died, twelve hours after the operation. It was found that the dura mater was not perforated; the lesser wing of the sphenoid was broken, and parts of the ascending parietal and third frontal convolutions were severely bruised, but otherwise the brain was healthy. Here we have a case in which the thermolytic and thermogenetic centres were not injured, yet there was a rapid rise of temperature—more than a degree an hour—continuing after the bullet was removed, and taking place so immediately after the wound and the operation that the combined shock—which of itself would tend to depress the temperature—of these two could not have passed off. These facts make one strongly suspect that the thermotaxic mechanism was deranged, more especially as other higher centres were disorganized, for the patient was admitted unconscious, and remained so till he died.

¹ Guy's Hospital Reports, 1884, p. 91.

My other clinical case, which appears to localize thermotaxis in the cortex, is that of a man with meningitis, who died within twenty-four hours of the onset of the first symptom, and who had hyperpyrexia, the temperature, which reached 110° F., for two or three hours rising at the rate of two or three degrees an hour, and this, at one part of the rise, in spite of the fact that he was being sponged with ice-cold water. The meninges were acutely inflamed, and it does not seem improbable that the irritation caused by the meninges disorganized the cortical thermotaxic function.



We may, therefore, I think, conclude that the theory of a heat mechanism and its evolution, stated in the first part of this article, has many facts in its support, and there are none which disprove it. Throughout this paper the word centre has been used in its ordinary meaning; although it is a word which should be avoided, it is often difficult to find a substitute. Both the thermogenetic and the thermo-

lytic centres and their efferent nerves are probably both anabolic and katabolic, but for the sake of simplification this subdivision has been omitted.

The accompanying diagram is intended to show that the thermolytic mechanism acts chiefly through the lungs and skin, and the thermogenetic chiefly through the muscles; that the thermotaxic maintains a balance between these two; that either centre can be affected reflexly, and that all parts of the mechanism can be influenced by the quality of the blood circulating through them.

CASE OF AORTIC ANEURISM PRESENTING ONLY INDIRECT SYMPTOMS.

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Reported by WILLIAM R. JACK, M.B., C.M.,

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J. B., aged thirty-six years, by trade a driller, was admitted to Ward 11 of the Western Infirmary on November 16, 1889, complaining of hoarseness of four months', cough of two months', and expectoration of six weeks' duration.

He stated that he caught a chill in the end of June, and two days afterward was attacked with hoarseness. The doctor who examined him could detect nothing in the throat, and he therefore neglected the hoarseness, which remained unchanged. Two months before admission cough began, for which he was "painted" with some external application. This gave no relief, and shortly afterward he had to stop work owing to the severity of the cough, which was frequently so great as to produce vomiting. Expectoration of a clear, thick sputum also began about two weeks afterward. Since the onset of his illness he has been subject to night-sweats, but there has been only slight emaciation. The bowels are moved twice daily. Appetite is good. He has never had any pain in the throat or chest. He suffers from palpitation and shortness of breath—both being worse on exertion and relieved on sitting or lying down.

On examination there are found indications of commencing consolidation at the right apex, and at the left prolongation of expiration, with sibilant râles. The expectoration, which is frothy and muco-purulent, contains no tubercle bacilli. Over the whole left lung, back and front, the respiratory murmur is much weaker than on the right side.

The heart-sounds are normal. The apex-beat is not displaced, nor is the dulness enlarged. Both radial pulses are equal.

The left pupil is dilated and fixed, but the fundus is normal, while the right optic nerve is pale and cupped at its margin.

The voice is replaced entirely by a whisper, and the cough is "incomplete" and laryngeal in character. On examination of the larynx the left vocal cord is found to be paralyzed in the cadaveric position.

All down the right side of the neck there are the scars of old strumous ulceration.

The case was evidently one of intra-thoracic pressure, the cause of pressure being seated at the root of the left lung. The presence of an aneurism springing from the back of the left side of the arch of the aorta was suspected. There was a total absence of physical signs, and as there was evidence of old strumous mischief, I *hoped* that the case might be one of pressure due to enlarged and strumous bronchial glands. The case was, therefore, treated by antistrumous remedies. Under these he gained in weight, but improved in none of his essential symptoms, which remained much as before until the morning of February 4th, when, slightly after midnight, he was wakened by his cough, and sat up in bed. Very soon he spat up a mouthful of blood, and immediately afterward blood gushed in torrents from his mouth, and he was dead within five minutes of his wakening.

On post-mortem examination a small aneurism was found, arising from the back part of the thoracic aorta just beyond the arch. It communicated by an oval aperture with the left bronchus, while just above the aperture there was a point, rather larger than a pin's head, at which the bronchial wall was much thinned. The aneurism pressed upon the trachea and left bronchus, and stretched the left recurrent laryngeal nerve.

In some cases of aneurism, depending to a considerable extent upon the part of the arch from which it springs, the direct symptoms—physical signs—constitute the most prominent features; in others the indirect—or pressure—symptoms. But it is not so widely known as it ought to be, that the indirect or pressure symptoms often exist with very little trace of physical signs, especially when the aneurism springs from the back of the deepest part of the arch. I have myself met with a number of such cases. One of these is reported in the *Edinburgh Medical Journal* (July, 1881). In it there was a total absence of physical signs, the indirect symptoms consisting of bilateral paralysis of the vocal cords, dislocation of the heart, and pressure upon the left bronchus and left innominate vein, with feeble left pulse. In another case, which I saw in consultation with Dr. Samuel Sloan, and which he reported in the *Glasgow Medical Journal*, (February, 1882), there were no physical signs, with the exception of a systolic murmur at the base of the heart, the parts pressed upon being the heart, the left bronchus, and the nerves. In a third case, which I reported in the *Lancet* (November 10, 1883), the only physical sign was a basic diastolic murmur, the indirect symptoms consisting of pain in the chest and at the root of the neck posteriorly, with symptoms of pressure upon the trachea and recurrent laryngeal nerve. In all the cases the diagnosis was verified by post-mortem examination. The importance, therefore, of an accurate knowledge and appreciation of the pressure symptoms of intra-thoracic aneurism is at once apparent.

SOME FURTHER REMARKS UPON THE INFLUENCE OF
LEUKÆMIA UPON PREGNANCY AND LABOR.¹

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At the Washington Congress, three years ago, I read a paper before the Obstetrical Section upon the influence of leukæmia upon pregnancy and labor,² and gave a series of observations upon a patient who, while undoubtedly leukæmic, had passed safely through two pregnancies, borne two living children, and was, at the time, again well advanced in pregnancy. Cases had been observed where leukæmia seemed to begin during, or as the result of, pregnancy; but up to that time none had been recorded where a woman already leukæmic had become pregnant and borne a living child. By this case it seemed to be clearly proven that a *leukæmic mother* may bear a *non-leukæmic child*, and that consequently the foetal and maternal circulations are separate and distinct, and the placental barricade impervious to leucocytes. It seemed also proven that leukæmic symptoms are aggravated during the course of pregnancy but subside rapidly after its conclusion, and that leukæmia does not necessarily prevent conception or even limit the frequency of its occurrence. A number of other interesting questions were incidentally suggested, especially touching the etiology and prognosis of the disease.

Since the Washington Congress several new cases have been reported which throw fresh light upon the subject.

Dr. Greene, of Morgantown, Indiana, reported two cases³ which, though defective, are nevertheless of considerable value. The first was one of acute leukæmia in a primipara, proving fatal in six months. The second is doubtful, and cannot be admitted without further evidence. Dr. Greene reports to Prof. Jaggard⁴ that his second patient has since been pregnant, and again developed leukæmic symptoms which disappeared after the induction of abortion.

Dr. Saenger, of Leipzig,⁵ reported the case of a leukæmic mother who bore a healthy child, and another of a healthy mother who bore a leukæmic child. His article is by far the most complete which has yet been published, and is well worthy careful study.

Professor Jaggard, of Chicago,⁶ has just reported another case where

¹ Read before the International Medical Congress, at Berlin, 1890.

² AMERICAN JOURNAL OF THE MEDICAL SCIENCES, January, 1888.

³ New York Medical Journal, February 11, 1888, p. 144.

⁴ Medical News, July 19, 1890, p. 53.

⁵ Archiv für Gyn., Bd. xxxiii. Hft. 2.

⁶ Medical News, July 19, 1890, p. 49.

leukæmia developed a few weeks after confinement and terminated life within a year. His patient, æt. thirty-four, VI-para, with a good family history, had borne five healthy children, had no history herself of malaria, syphilis, alcoholism, or traumatism. Three weeks before her sixth labor she was in robust health and weighed one hundred and fifty-eight pounds. The puerperium was normal except for the failure of lactation, and she was up and at work on the tenth day. She then noticed stinging paroxysmal pains in the left hypochondrium but no tumor was perceptible. Menstruation appeared six weeks after labor and once again a little more than five months afterwards. Eight weeks after labor a splenic tumor was first noticed; thenceforth its growth was rapid, splenic pain, emaciation, and malaise increased, and she died eleven months and nineteen days after confinement. The disease was acute and progressive. Blood: red corpuscles per c.mm. 3,255,000. White corpuscles per c.mm. 1,178,000. $W : R = 1 : 2.7$.

Prof. Jaggard remarks: "The history of the case seems to point to some necessary relation between pregnancy or between prolonged lactation during pregnancy, or both these factors, and the leukæmia. The evidence, indeed, is only probable, but it is sufficient to create a presumption."

Dr. W. O. Stillman, of Albany, sends me the notes of a case where leukæmia developed in the course of pregnancy and proved fatal one month after confinement. Mrs. T., æt. thirty-four, IV-para, first seen in October, 1887, was then suffering from general œdema, extreme pallor, dyspnoea, epistaxis, and general lymphatic enlargement. Blood: red corpuscles per c.mm. 800,000. $W : R = 1 : 3$. The child was healthy, and at last accounts was thriving well. The patient gave an account of similar symptoms in a minor degree during her second pregnancy; but she quite recovered after confinement.

Since my former article was written my patient has been safely delivered twice, and an opportunity has been afforded to make some further observations.

Mrs. S., æt. thirty-seven, VIII-para, ceased to menstruate May 5, 1887; morning sickness soon began and blood was vomited from time to time. The spleen and liver enlarged and became tender as in previous pregnancies.

July 22. Oblique line of splenic dulness 20.5 cm. (8 inches), and edge of spleen within 9 cm. ($3\frac{1}{2}$ inches) of the umbilicus. Downward in the axillary line the dulness extends 20 cm. (8 inches), reaching the crest of the ilium. No increase in hepatic dulness. Blood: red corpuscles per c.mm. 1,406,000. $W : R = 1 : 20$.

August 18. Looks more pale and puffy; splenic dulness about the same. Blood: red corpuscles per c.mm. 1,373,000. $W : R = 1 : 3$.

Since the last count the red cells have not diminished very much, but the white cells have enormously increased.

January 13, 1888. Since last examination has been in fairly good health, doing her household work and driving twice a week to market, but during the past fortnight the legs and feet have begun to swell, attacks of epistaxis have been more severe, and dyspnœa more troublesome. Blood: red corpuscles per c.mm. 2,330,000. White corpuscles per c.mm. 56,000. $W : R = 1 : 42$ nearly.

February 14. Since last examination her condition has grown rapidly worse; the œdema becoming more marked, the dyspnœa, cough and palpitation very distressing, and the attacks of epistaxis more frequent and severe. She was confined at her own home of a living child two hundred and eighty-four days from the cessation of the menses. Labor was rapid, very little blood was lost, the dyspnœa and palpitation were distressing, but were greatly relieved after the termination of labor. The next day the following counts were made (average of four counts): *Mother*, red corpuscles per c.mm. 2,100,000. White corpuscles per c.mm. 54,000. $W : R = 1 : 39$ nearly. *Child*, red corpuscles per c.mm. 6,600,000. White corpuscles per c.mm. 20,000. $W : R = 1 : 330$. *Umbilical artery*, red corpuscles per c.mm. 6,340,000. $W : R = 1 : 350$. *Umbilical vein*, red corpuscles per c.mm. 5,150,000. $W : R = 1 : 300$.

19th. Five days post-partem. Lochia scant, slimy, and offensive. Blood: *Mother*, red corpuscles per c.mm. 1,970,000. White corpuscles per c.mm. 65,000. $W : R = 1 : 30$. *Child*, red corpuscles per c.mm. 6,520,000. White corpuscles per c. mm. 20,000. $W : R = 1 : 326$.

Throughout the puerperium the temperature and pulse curves were normal. The breasts filled with thin watery milk, and, contrary to advice, she kept the child to the breast for three or four days. The child, though plump and healthy-looking at birth, never thrived, but seemed to fail daily. After the first week nursing was entirely stopped and the child fed artificially. It took food eagerly but did not assimilate it. Diarrhœa and vomiting finally set in and the child died at the beginning of the fifth month. No autopsy was held. The mother did not convalesce as rapidly or satisfactorily as after her previous confinement, and it was fully nine months before she regained her usual degree of health. The menses reappeared in June, painful, profuse, lasting six or seven days, and confining her to bed. Menstruation continued regular throughout the winter and spring, but ceased once more on May 5, 1889. Nausea and vomiting and hæmatemesis began as before. The attacks of epistaxis began earlier, were more frequent and severe. Every three or four weeks a quantity of blood came away per rectum. Dizziness and vertigo became so distressing that she could not walk alone; she had to be led or supported when moving from place to place. Hot flashes, cold sweats, palpitation, cough, and dyspnœa added to her discomfort.

September 19, 1889. She entered the Montreal General Hospital and remained till October 5th under the care of Professor R. L. Macdonnell, to whom I am indebted for the notes of her case while there.

Liver dulness in mammary line extends from sixth rib to two inches below the costal margin, 14.7 c.m. ($5\frac{7}{8}$ inches).

Splenic dulness in mid-axillary line extends downward and somewhat forward for 22-23 cm. ($8\frac{1}{2}$ -9 inches) in an oblique direction, 19 cm. ($7\frac{1}{2}$ inches) transversely, reaches within one inch of the crest of the ilium, and within two inches of the umbilicus. A blowing murmur is

heard over the mitral area, transmitted slightly to the left, and heard also at the base. No hypertrophy of the heart. Urine: sp. gr. 1025, heavy deposit of urates, no albumin, no sugar. Had several attacks of epistaxis while in hospital. Blood (Sept. 29th): Red corpuscles per c.mm. 2,300,000. $W:R = 1:28$.

November 30. Patient entered the Montreal Maternity almost in collapse. She fainted while being carried to her room. The breathing was rapid and labored, the heart's action embarrassed, the slightest attempt to rise from the recumbent position was followed by fainting. Nausea and vomiting were persistent, cough troublesome, temperature normal, pulse 120-160, and very feeble; she was sleepless and delirious, muttering and picking at the bed-clothes. Fœtal heart sounds could not be heard, neither could fetal movements be felt. Hypodermic injections of ether were given till she rallied, and then enemata of brandy and beef-tea were administered every four hours. By the next day she was somewhat stronger, but a severe epistaxis brought her again to death's door. It was decided to empty the uterus as soon as she could bear manipulation. On December 3d, at 7 p. m., a bougie was passed into the uterine cavity. Slight pains began during the night. The following morning the os was found to be fully dilated and the head presenting. The membranes were ruptured at 11.30 a. m., and a dead child delivered in seventy minutes. Scarcely a trace of blood was to be seen when the placenta was pressed off fifteen minutes afterward. As the child was passing the vulva the patient fainted, the pulse flickered out, and for a few moments the heart's action seemed to have ceased, but repeated hypodermics of ether roused it to action. The lochia were slimy and offensive. Throughout the puerperium the temperature was normal or subnormal, but the pulse was rapid and variable. Persistent cough prevented sound sleep; a large quantity of frothy mucus was expectorated during the first six or seven days. There was more or less delirium for a week. No milk appeared in the breasts. Epistaxis occurred occasionally, and convalescence was slow. She left the Maternity on December 22, 1889. Even at the present time she remembers very little of what transpired during her stay in the Maternity, and nothing at all about her confinement. The child, born 213 days from the cessation of the menses, was small and poorly nourished, and had been dead for some days. Unfortunately the blood-counts made at the time of this confinement are unreliable and cannot be included with the others. Menstruation was reëstablished in March, and has continued regular, but profuse. She now attends to her ordinary duties, but feels much feebler than formerly. She still has occasional attacks of epistaxis, œdema of the lower extremities, and dyspnœa and vertigo when she goes up stairs. The hepatic enlargement remains about the same as before; the spleen has grown a little larger, extending now below the iliac crest and dipping into the false pelvis.

July 15, 1890. Blood: microscopically, nothing unusual. Red corpuscles, per c.mm. 4,000,000. $W:R = 1:200$. Hemoglobin index, 75. Retina normal.

The children have been carefully examined, with the following results:

Walter, æt. eighteen, is sallow, delicate, tires easily on exertion, and is subject to epistaxis. Had articular rheumatism in 1880 and 1883.

and again in April, 1890, in the Montreal General Hospital. During this last attack in hospital hepatic dulness was found to begin at the fifth rib and extend downward in the mammary line 11.5 cm. (4½ inches) to the costal border. Splenic dulness began at the seventh rib in the post-axillary line and extended downward 11.5 cm. (4½ inches), and transversely 10 cm. (4 inches). There was general glandular enlargement, the glands all over the body being distinctly felt, and not painful on pressure. At the present time the glands of the neck, groin, and axilla are enlarged. The following blood-counts have been made since last report:

February 19, 1888. Red corpuscles, per c.mm. 4,620,000. W:R = 1:230.

April 6, 1890. Red corpuscles, per c.mm. 2,500,000. W:R = 1:155.

July 15, 1890. Red corpuscles, per c.mm. 3,480,000. W:R = 1:117. Microscopically corpuscles show moderate poikilocytosis, blood-plates abundant, a few microcytes. Hæmoglobin index, 78.

Arthur, æt. seventeen, subject to epistaxis, otherwise in good health; spleen normal, no glandular enlargement.

Lydia, æt. fourteen. *July* 16, 1890, red corpuscles 5,240,000 per c.mm. W:R = 1:300. Hæmoglobin index, 85. Microscopically normal.

Louisa, æt. eleven. Resembles her mother very much in general appearance. Has had undoubted leukæmia once, and is generally ailing. Spleen and cervical glands enlarged. Blood (*July* 15, 1890): red corpuscles, per c.mm. 3,930,000. W:R = 1:150. Hæmoglobin index, 80. Blood is watery, normal microscopically.

Charles, æt. nine. Spleen enlarged, also glands of neck, groin, and axilla. Enjoys fairly good health. Blood (*July* 16, 1890): red corpuscles, per c.mm. 5,050,000. W:R = 1:250. Hæmoglobin index, 100. Normal microscopically.

Freddy, died aged six months. *Vide* former report. Had leukæmia in the Montreal General Hospital.

For the numerous blood-counts and careful microscopic examinations of the blood in this case I am indebted to Dr. Wyatt Johnson, demonstrator of pathology at McGill University, and for the ophthalmological report to Dr. John J. Gardner, assistant oculist to the Montreal General Hospital.

CONCLUSIONS.—From the observations now on record the following conclusions seem to be justified:

1. A leukæmic mother may go to full term and bear a healthy child.
2. Leukæmia tends to bring on labor prematurely or reduce the patient to such a critical state that the premature induction of labor becomes advisable.
3. Leukæmia in pregnant women tends to run a rapidly fatal course; yet occasionally its progress may be slow, though progressive.
4. During the first three or four months of gestation, a leukæmic patient may not suffer much inconvenience; but as intra-abdominal tension increases, her distress becomes greater, graver symptoms rapidly

develop, and the patient is quickly reduced to a pitiable and dangerous condition.

5. Leukæmia does not prevent the occurrence of pregnancy, nor does it seem to limit its frequency.

6. As regards the relative characters of blood in the maternal, fetal, and placental circulation, later observations confirm those made on a previous occasion.

7. While epistaxis, hæmatemesis, and melæna may occur frequently during the progress of gestation, there may be no uterine hæmorrhage at the time of labor or during the puerperium.

8. Menstruation may be affected. In the case of Mrs. S. menstruation was scanty and painless before the appearance of leukæmia; since, it has been profuse and painful.

9. Leukæmia seems sometimes to have an injurious effect upon lactation. In Mrs. S., who had always been a good nurse, the function was either suppressed or the milk so altered in quality as to become unwholesome and injurious.

10. The question of hereditary influence or predisposition is unsettled, but the case of Mrs. S. is very suggestive. The grandmother, mother, and brother suffered from symptoms pointing to leukæmia; two of her own children have had undoubted leukæmia, all have had jaundice, most are subject to epistaxis, all have glandular enlargement and more or less anaemia. It is more than probable that some of these children will sooner or later develop leukæmia. One child at least (Louisa), born before her mother showed signs of leukæmia, suffered from well-marked leukæmia lienalis. Although a mother does not transmit leukæmia directly to her child, is it not very probable that she may transmit a tendency or predisposition thereto?

TABLE I.—(MRS. S.) BLOOD-COUNT; AVERAGE OF THREE COUNTS.

Date.	Red cells.	W. : R.	Remarks.
1885. Sept. 17 . . .	2,400,000	1 : 10	In the Montreal General Hospital three months after confinement.
" Sept. 25 . . .	2,600,000	1 : 17	Left Montreal General Hospital Nov. 24
" Oct. 31 . . .	2,480,000	1 : 12½	
1886. April 28 . . .	3,400,000	1 : 50	One month pregnant.
" May 3 . . .	2,600,000	1 : 45	
" Oct. 8 . . .	1,670,000	1 : 10	
" Oct. 29 . . .	900,000	1 : 1	Two hours after delivery.
" Nov. 1 . . .	1,100,000	1 : 20	
" Nov. 9 . . .	1,600,000	1 : 35	Discharged from the Montreal Maternity.
1887. July 22 . . .	1,480,000	1 : 20	Between two and three months pregnant.
" Aug. 18 . . .	1,375,000	1 : 3	Between three and four months pregnant.
1888. Jan. 13 . . .	2,310,000	1 : 42	
" Feb. 15 . . .	2,110,000	1 : 35	The morning after delivery.
" Feb. 19 . . .	1,570,000	1 : 30	Five days post partum.
1889. Sept. 29 . . .	2,320,000	1 : 28	
1890. July 15 . . .	4,000,000	1 : 200	

TABLE II.—COMPARISON OF BLOOD-COUNTS OF MOTHER, CHILD, AND PLACENTA; AVERAGE OF THREE COUNTS..

Date.	Subject.*	Red cells.	W. : R	Remarks.
1886. Oct. 29	Mother . . .	990,000	1 : 4	Two hours after delivery.
" Oct. 29	Child . . .	5,210,000	1 : 175	
" Oct. 29	Umb. vein (trunk)	4,610,000	1 : 173	Eighteen hours after expulsion of the placenta.
" Oct. 29	" " (branch)	4,600,000	1 : 128	
" Oct. 29	Umbilical artery .	5,410,000	1 : 270	
" Oct. 29	Placental sinuses .	950,000	1 : 3.6	
1886. Nov. 1	Mother . . .	1,100,000	1 : 20	
" Nov. 1	Child . . .	5,000,000	1 : 150	
1888. Feb. 15	Mother . . .	2,100,000	1 : 39	The morning after delivery.
" Feb. 15	Child . . .	6,600,000	1 : 330	
" Feb. 15	Umbilical vein .	6,150,000	1 : 300	Twelve hours after expulsion of placenta.
" Feb. 15	" " artery .	6,340,000	1 : 350	
" Feb. 19	Mother . . .	1,970,000	1 : 30	Five days post partum.
" Feb. 19	Child . . .	6,520,000	1 : 325	

TABLE III.—BLOOD-COUNTS OF CHILDREN; AVERAGE OF THREE COUNTS.

Date.	Name.	Red cells.	W. : R.	Remarks
1887. July 13	Walter, æt. 15	3,355,000	1 : 200	In Montreal General Hospital.
" Aug. 18	" æt. 15	3,210,000	1 : 200	
1888. Feb. 19	" æt. 16	4,620,000	1 : 230	
1890. April 6	" æt. 18	2,500,000	1 : 155	
" April 6	" æt. 18	3,480,000	1 : 117	
1887. July 13	Arthur, æt. 14	4,725,000	1 : 350	
1887. July 13	Lydia, æt. 11	4,795,000	1 : 350	
1890. July 16	" æt. 14	5,210,000	1 : 300	
1885. Oct. 12	Louisa, æt. 6	1,912,000	1 : 15	{ Was in Montreal General Hospital, from October 5 to December 12, 1885, with leukæmia; spleen enlarged.
" Dec. 2	" æt. 6	3,576,000	1 : 16	
1887. July 13	" æt. 8	4,220,000	1 : 300	In failing health.
" Aug. 18	" æt. 8	3,183,000	1 : 240	
1890. July 15	" æt. 10	3,930,000	1 : 150	
1887. July 13	Charles, æt. 6	4,525,000	1 : 350	
1890. July 16	" æt. 9	5,050,000	1 : 250	
1885. Sept. 15	Fred., æt. 3 mo.	.....	.....	{ Spleen enlarged, red corpuscles diminished, white increased; blood-count lost. Died at six months.

AN ANALYSIS OF THE MOTOR SYMPTOMS AND CONDITIONS
OF THE OCULAR APPARATUS, AS OBSERVED IN IMBECILITY,
EPILEPSY, AND THE SECOND STAGE OF
GENERAL PARALYSIS OF THE INSANE.

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THE present paper combines a series of observations and conclusions, the result of four years' work in this class of cases at the State Hospital for the Insane at Norristown, Pa. The grouping of the motor innervations and actions as seen in epileptic dementia, as shown in imbecility in the adult male, and as found in the second stage of so-called general paresis, into a separate and distinct analysis from that of the sensory changes of the same apparatus, has served to form a portion of the Tenth Annual Report of the Institution. It is here presented as a series of conditions and actions which are so frequently observed amongst such individuals as seemingly to admit of sufficiently broad generalizations to allow proper, though of course tentative, conclusions.

Certain governing rules in the selection of the cases, which have been established from the first observation, and which are believed to be of sufficient importance to demand recapitulation are here given:¹

1. A special variety of symptomatic disease was taken in preference to any mental condition, because similar mental states in the many and bizarre forms of nerve lesions, masking and hiding the true significance of the objective symptoms peculiar to any one disease to such an extent as to render differentiation impossible, are very frequent in mental disorders.

2. A definite variety of disease was chosen, so as to avoid obtaining a mere percentage of the ophthalmic signs of the total number of cases occurring in one asylum—an answer which through constant changes in the number of the resident population or temporary peculiarities in the character of mentality, is liable to alter at any time, and thus make such an analysis give results and conclusions which would be totally diverse from those that might be obtained by another observer placed in a different situation.

3. A large percentage of similar cases was taken. This was done so that the different mental states which are seen during a definite situation in the course of any one disease might be united in a theoretical example of the physical and physiological conditions of the disease at that stage.

¹ See *Proceedings of the Philadelphia Neurological Society* for December 27, 1886, in the *Philadelphia Medical Times*, February 5, 1887, and elsewhere.

4. Males were used; this is important, for, by the exclusion of the female subject, any errors that might arise from additional ocular changes dependent upon diseases which are peculiar to the sex would thus be avoided.

At first, among the epileptics, no differential diagnoses were attempted as to the causation of the convulsions, this being done so as to embrace the entire grouping of such cases into a common lot of subjects, in order to have the greatest variations of supposable differences present at one and the same time, and thus to give greater latitude to error. Later, however, as the subject became more familiar and finer differentiations became more visible, attempts were made to isolate the cases into specialized groupings. Although most of the peculiarities of the pupil, independent of local adhesions or individual differences in the behavior of the irides which could be accounted for by refractive error, seemed to be in direct correspondence with the local conditions of the optic nerves and retinae, yet in a few instances there were some very curious errors of extra-ocular and intra-ocular muscle-action, which no doubt were the visible expressions (just as the rest) of some peculiar though definite phases in the natural history of the general disease.

During the examination of the imbeciles the following precautions were observed:¹

"First. Care was taken to exclude all but the proper class of subjects, no one being admitted who could not be properly designated as one with decided loss of mental power of a minor degree than idiocy, from malformation or disease of the nervous system, either supervening in infancy or occurring before birth. This was done so as to avoid any error that might arise from the presence of ocular symptoms which might be dependent upon other malformation or disease, and to exclude any question as to the use of eyes for prolonged near-work during the early years of life.

"Second. Subjects chosen whose eyes were free from extraneous disease or inflammation. Sore eyes of inflammatory and traumatic types were avoided, so as to obtain as nearly as possible representative peripheral (end) organs of comparatively healthy functional activity.

"Third. Young adults were used. This was done for two reasons: first, to have the eye at its full maturity, and thus not to allow any question of further development to enter into the argument; and second, to have the tissues of the eye at their best before any of the processes of natural decay should have manifestly asserted themselves.

"Fourth. Males have been taken. These were chosen so as to avoid any errors that might arise from additional ocular changes which might be associated with diseases peculiar to the female sex.

¹ See Transactions of the American Ophthalmological Society, 1887.

"Fifth. Every subject was submitted to the same routine examination, thus preventing any seemingly gross changes to appear that might arise from differences in methods of study.

"The reasons for such rules must be obvious, as by their observance all faults in working and want of precision in method are reduced to a minimum, and the conclusions, which are the very import of the work, are thus rendered more valuable and less liable to grave and deceptive error."

In the third series of cases great care was also taken that each subject was seemingly free from any extraneous general disease or local disorder, and that competent and authoritative medical opinion had been given as to the type of the general complaint; besides, the entire study in this direction has been limited to the male sex, so as to escape any conflicting complicating changes that might appear in connection with the many diseases peculiar to the female sex.

OBSERVATIONS: INTRA-OCULAR MUSCLES.

Epilepsy.

First. Iris muscle innervation in most instances seemingly normal in reference to both the age of the patient and the refractive condition.

Second. Iris muscle action, as a rule, apparently unimpaired both in separated and combined motion.

Third. Ciliary muscle innervation, as a rule, most probably normal.

Fourth. Ciliary muscle action apparently generally unaffected; being in direct proportion to what should be expected for age and refractive change.

Imbecility.

Fifth. Iris muscle innervation generally normal for age and amount and character of error of refraction.

Sixth. Iris muscle action sometimes sluggish to efforts for convergence and accommodation, though rather more prompt to light-stimulus; the degree of these acts being in due proportion to the grade of imbecility.

Seventh. Ciliary muscle innervation apparently normal.

Eighth. Ciliary muscle action impossible to obtain accurately subjectively, though objectively there appeared to be a deficient response in a few cases.

Second Stage of General Paresis.

Ninth. Iris muscle enervation frequent, as shown by more or less irregularities in pupil-form; this being notably seen not only in different subjects, but of frequent occurrence at various times in the same patient.

Tenth. Iris muscle action generally lessened to light-stimulus, frequently unequal to light-stimulus and accommodation, and in several instances very feebly responsive to efforts for accommodation and convergence alone; these changes often manifesting themselves in the two irides of the same subject.

Eleventh. Ciliary muscle innervation lessened, although no reliable subjective and objective method could be used to scientific advantage and accuracy.

Twelfth. Ciliary muscle action probably pathologically decreased independent of senile change and character of error of refraction; this most absolutely certain, and sometimes seemingly rendered apparent by the use of the retinoscope.

EXTRA-OCULAR MUSCLES.

Epilepsy.

Thirteenth. Extra-ocular muscle innervation seemingly proper in the vast majority of cases, a few cases showing some peculiarities in motor station: the quite large number of insufficiencies of the interni that could be properly studied being in every instance associated with an existing compound hypermetropic astigmatism.

Fourteenth. Extra-ocular muscle action apparently intact in all directions, although in the greater number of cases of insufficiency that could be depended upon, there was a preponderant work given to the interni for proper binocular adjustment; this latter condition in every case, however, having both farsightedness and astigmatism associated with it.

Imbecility.

Fifteenth. Extra-ocular muscle innervation, as a rule, apparently normal; fully one-half of the cases examined preserving proper muscle balance.

Sixteenth. Extra-ocular motion intact in all directions; a very slight insufficiency of the internal recti being found in about fifty per cent. of cases.

Second Stage of General Paresis.

Seventeenth. Extra-ocular muscle enervation the rule, as shown by insufficiencies of all the straight muscles, though more particularly when the interni were associated in action with efforts for convergence.

Eighteenth. Extra-ocular muscle action weakened, as seen by peculiar nystagmic motions which are made visible at the moment of the utmost contraction of the experimented muscle, and the preponderance

of insufficiencies of the recti muscles, especially the interni, over their related refractive conditions.

CONCLUSIONS.

First. In idiopathic epilepsy of the male adult, even where the stage of dementia has been reached, both the intra-ocular and the extra-ocular motor-groupings seemingly, as a rule, remain unimpaired both as to innervation and to active impulse, although in some instances curious enervations and limitations of action seem to exist.

Second. In the lower grades of imbecility, as seen in the male adult, which have resulted from malformation or disease of a minor degree than that producing so-called idiocy, that have supervened in infancy or occurred before birth, both the intra-ocular and the extra-ocular muscle-groupings, as a rule, remain unaffected both as to innervation and as to proper action; in fact, they seem ordinarily to retain their original condition without any pronounced indications of wear and tear; a condition that most probably evidences very little abuse of a delicately poised muscular apparatus.

Third. In the second stage of paresis, as seen in the male, both the intra-ocular and the extra-ocular motor-groupings are in all instances more or less paretic, as evidenced by inequalities and irregularities of pupillary areas, with peculiarities in iritic movement and loss in ciliary tone and power, as well as by extra-ocular insufficiencies and ataxic nystagmic motions—all indicative of imperfect muscle-innervation and inadequate muscle-action.

REVIEWS.

THE ANATOMY OF THE CENTRAL NERVOUS ORGANS IN HEALTH AND IN DISEASE. By DR. HEINRICH OBERSTEINER, Professor (Ext.) at the University of Vienna. Translated, with Annotations and Additions, by ALEX. HILL, M.A., M.D., M.R.C.S., Master of Downing College, Cambridge; Examiner in Anatomy to the Universities of Cambridge and Glasgow. With 198 Illustrations. Philadelphia: P. Blakiston, Son & Co., 1890.

THE treatise of Obersteiner has been in the original before the profession since 1887, and its merits have been recognized by many neurologists to whom the work and standing of its author are well known; but to the medical student, the general practitioner, and even to some specialists and semi-specialists, this valuable text-book, volume of reference, and laboratory hand-book has not been accessible because of the lack of a good translation. Professor Alexander Hill, of Cambridge, who stands in the front rank of English anatomists, has now supplied this translation to the English-reading profession—an admirable one, not having the clumsiness and want of clearness which often attach to some, even accurate translations of German medical text-books, a fault which has detracted greatly from their value. Professor Hill says that he has always held that to transform a book from one language to another needs the collaboration of members of both nationalities, and he expresses his indebtedness to Fraulein Kloss for having read through all of the German text with him, also acknowledging the direct assistance of Professor Obersteiner in explaining obscure passages. In brackets and foot-notes the translator has made numerous, and in most cases extremely valuable, additions to the original text; he has introduced twenty-two illustrations, and in the index for the terms used in the German edition has given the commoner synonyms and French equivalents. These additions are not, as is sometimes the case with such work, mere trifles, or perhaps even impertinences on the part of the translator. They are particularly rich in suggestions as to the architecture, mechanism, and functions of the nervous system. Occasionally his views differ from those of Obersteiner, but they are presented in such a way as not to conflict or cause confusion in the mind of the student.

The value of the illustrations, 198 in all, is enhanced by the manner in which they are introduced and arranged in order to carry out the process of progressive teaching. The drawings of the microscopical sections, for example, if followed successively through the different stages of the book, will leave the student at last with a good, practical knowledge of the histology and pathology of the nervous system. Obersteiner says truly of models that we do not as yet possess any that are completely satisfactory.

A glance at the method and arrangement of the book may be useful to those desiring to decide as to the purchase of a new neurological work. The first section includes the best methods of studying the nervous system, containing succinct, careful descriptions of such processes as defibering, hardening, cutting, imbedding, staining, coloring, and impregnating, and giving in connection with the methods the general appearances, and some of the results to be obtained. Morphology is next discussed—the best methods for microscopic work are detailed; the development of the nervous system is presented by the translator; the various divisions of the nervous system are described as to their gross appearances with excellent illustrations of natural size, a diagrammatic and lettered drawing usually accompanying the view. The anatomical details in this portion of the book, while much the same as may be found in many recent works, are presented in an unusually clear and instructive manner, and some unfamiliar details are brought out. A third section contains a description of histological constituents beginning with the fibre and cell and concluding with the vessels and miscellaneous tissue-elements of the nervous system. The minute structure and the topography of the spinal cord; also the topography of the brain, including under this head the oblongata and pons, and basal portions of the brain, are considered. The sixth section treats in an intelligible manner of the course of the fibres connecting the various parts of the nervous system; this description involving by reason of the philosophical plan of the author a discussion of the entire neural tracts from their peripheral to their central end-points, hence including some discussion of the ganglia, cortex, and association-tracts. Finally, the cavities of the central nervous system receive attention.

The book is packed with facts, many ancient and classical, many from various sources of recent date, and many original with the author and translator. To some of the valuable additions and suggestions of the latter we might direct attention. Hill lays stress upon the fact that the brain during its growth exhibits a well-marked tendency to bulge into defined lobes, and concludes from his survey of mammalian brains that these natural lobes have a distinct morphological, and presumably also a distinct physiological significance. In an appendix he summarizes his views on the rotation of the great brain, first published in 1885, in a monograph on *A Plan of the Central Nervous System*. These views are of great importance to an understanding of the form and subdivision of the adult brain. The hypothesis is that the mammalian brain during its growth rotates upon itself, thus producing a loop or kink, giving to the whole brain somewhat of the form of a ram's horn, and bringing the part which was at first in front on to the under side of the back. This view was almost a necessary deduction from the conclusion that the olfactory tract was connected with the front of the thalamus by way of the fimbria, fornix, corpus mammallaria, and bundle of Vieq d'Azyr, the tract ascending from each corpus mammallaria to the thalamus. This conclusion is of course not the only stone upon which the theory is built. Rotation of the great brain, according to Hill, accounts for many other features in the plan of its formation, as, to give but a single example, the appearance of the Sylvian fosa.

Owing to the continued prominence of the subject of cerebral localization, and also to the differences which still exist as to the functions of some of the brain areas, it may be worth while to note the views held

by both the author and translator. In general these views seem to coincide with those held by the English and American physiologists and neurologists. The one portion of this subject still most obscure and most disputed, that of the cortical localization of the cutaneous sensations, is discussed, but not cleared of its mists either by Obersteiner or the translator.

The discussion both by Obersteiner and Hill of the so-called granule cells is sufficiently interesting to warrant particular attention. This quite distinct kind of nerve-cell in the substantia gelatinosa of the spinal horns, the retina, the olfactory bulb, and the nuclear layer of the cerebellum, Obersteiner considers as a peculiar tissue adjunct of the nervous system. Hill's hypothesis, which is novel, is that each granule cell "is a minute fusiform bi-polar cell intercalated in the course of a non-medullated fibre between its epithelial terminus and the plexus, into which it breaks up, from which plexus each large nerve-cell collects the products of many of these minute naked fibres, and associates them in a single medullated nerve for transmission to the central system. In the olfactory bulb, and for some distance along the olfactory tract, are found granules indistinguishable in appearance from those of the retina. Other conditions which obtain in the retina are also found in the olfactory bulb, and there is every reason for regarding the 'granules' of the two organs as similar in function. Although methods of isolation have hitherto failed to show the continuity between the protoplasm surrounding the granule and naked nerve-filaments, it is safe to assume that the granule is the nucleus of a bi-polar cell with non-medullated processes. The granule of the retina is the deposited epithelial cell which establishes a connection between the sensory epithelial cells and the central nervous plexus." He holds, in brief, that the granules in the cortex are fusiform cells attached to the terminal twigs of afferent nerve fibres; that they are sensory cells, in other words.

The four bulgings pointed out by Hill, namely, the frontal, opercular, occipital, and temporal, certainly constitute the best basis for a physiological division of the brain into lobes. He says of the unknown or uncertain region between the Rolandic and occipital lobe that it is difficult to say how it should be allocated. This is the region to which, in connection with the gyrus fornicatus, the reviewer has assigned the centres for common sensation; and arguments by exclusion, such as are afforded by Hill, would favor this location. The reviewer in his monograph on Cerebral Localization has also suggested a division of the brain into lobes, from physiological and clinico-pathological studies, which is confirmed by these embryological studies and suggestions of Hill.

To the spelling of the word "neurogleia," suggested by the translator, it is worth while to call attention, as it is a word of such frequent occurrence in neuro-pathology.

"Neuroglœa," says Professor Hill, 'would undoubtedly be more correct, but would affect the pronunciation. In German, the spelling neuroglia is perhaps unexceptionable, but it makes a terrible word in the English fashion. Not only the spelling of the term but also its application is, however, open to discussion. It appears to the translator to be a useful term when applied to the connective tissue of the central nervous system, which differs from other forms of connective tissue in its origin from epiblast; whereas, when restricted to the matrix it gives an undesirable definiteness to what is, after all, a hypothetical substance.'

Not one of the many books on the anatomy, pathology, physiology, and clinical aspects of the nervous system is just like this treatise. While much of the material has been necessarily received from other minds and hands, its presentation, as the author justly claims, rests throughout upon autoptic observations. When he details the numerous methods of examination, of defibering, staining, impregnating, etc., his descriptions of processes, and his judgments as to the comparative methods of different procedures show a practical familiarity with every detail of his subject. When he retails old facts as to the morphology of the central nervous system, the topography of brain or spinal cord, or the pathological conditions of vessels and membranes, one feels that a master is dealing with the questions expounded. Original explanations, novel suggestions, and scientific criticisms are made in the most modest manner. Obersteiner is a teacher as well as a scientific worker, and is evidently acquainted with the wants of both the beginner and the advanced student of neuro-pathology. This book should be in the library of every medical man interested in neurology. C. K. M.

THE NATURAL HISTORY AND RELATIONS OF PNEUMONIA: ITS CAUSES, FORMS, AND TREATMENT. A CLINICAL STUDY. By OCTAVIUS STURGES, M.D. Cantab., F.R.C.P., Physician to the Westminster Hospital and the Hospital for Sick Children, Great Ormond Street; and SIDNEY COUPLAND, M.D. Lond., F.R.C.P., Physician to the Middlesex Hospital. Second edition. London: Smith, Elder & Co., 1890.

AN occasional monograph is absolutely necessary to the best progress in any department of knowledge, and especially so if the latter is not included among the exact sciences. By such a work facts apparently contradictory are often reconciled, and threads of discussion unravelled which had seemed to be inextricably entangled. A critic might readily admit this, and yet contend that books of this sort also resemble halts or breathing-spaces, from which a fresh start is taken toward new contradictions and further entanglements. Such pessimism is given the *coup de grâce* by reference to successive monographs upon any subject whatever, or, still better, by comparing the different editions of the same one. In the work before us, for example, a comparison of its two editions shows that material progress has been made toward a thorough knowledge of the subject of which it treats. Since the first edition was published, in 1876, the study of bacteriology has illuminated some of the obscurest questions of pathology, and, in the opinion of many, has added pneumonia to the long list of infectious diseases. A new chapter on pathology was, therefore, a necessity. Another point of great importance is that increase in knowledge does not necessarily imply addition to the common fund, but may quite as truly mean subtraction. In other words, the detection and exposure of the false are next in importance to the recognition and welcome of the true. These different though harmonious functions of the monograph are so well performed by the one under review as to assure its place as a standard, and make the time remote when it will need a complete revision.

One of the first and greatest difficulties connected with the subject of pneumonia is a satisfactory clinical definition of the disease. Not a great while ago it was generally taught that the crepitant râle was pathognomonic of pneumonia, *i. e.*, that it was indicative of this disease and nothing else. Pneumonia might exist without this râle being audible, but when heard it certainly indicated pneumonia. This doctrine is, no doubt, still taught and widely accepted; but its falsity can be exposed by any resident physician of a large hospital who is moderately expert in physical diagnosis, and not afraid to trust the evidence of his senses. We have ourselves frequently heard the râle in patients with no chest disease whatever, at the termination of the first two or three deep inspirations, just after rising from a dorsal decubitus. In such cases the crepitation, which is very faint and evanescent, is indicative of nothing more than hypostatic congestion. We fully agree with Drs. Sturges and Coupland that the "absolute probative value of this sign has, in fact, been much exaggerated." Taken in connection with pyrexia, pain, altered pulse-respiration ratio, and rusty sputa, its significance is manifest; and the same remark is applicable to all the signs and symptoms mentioned, each one of which, taken singly, is comparatively worthless. It is too much the custom to rely for the diagnosis of pneumonia exclusively upon the physical signs, all of which "may be delayed until several days after its initial rigor."

Under the head of lobar pneumonia are doubtless often included cases of lobular or broncho-pneumonia, especially when these occur in the aged, and in infants and young children. This form of pulmonary inflammation often runs a subacute, or even latent course, and has thereby exasperated one author, who evidently confounds it with the true croupous or fibrinous pneumonia to such an extent as to cause him to speak of the latter, when it assumes this shape, as a "low, sneaking inflammation."

Such misconceptions compel the writer on pneumonia to give a clear definition of what he understands by the term, indicating in appropriate sections such deviations from the type as are caused by previous or concomitant illness, intemperance, starvation, mental depression, and the like. These important points are fully appreciated by our authors, who define pneumonia as "that form of lung inflammation which, whether fatal or not, is characterized by sudden onset, well-defined symptoms, distinct anatomical stages, and limited duration."

The associations of pneumonia with various acute and chronic diseases, such as phthisis, rheumatism, pericarditis, endocarditis, nephritis, influenza, etc., are discussed in a concise and interesting manner. Of these associations the last-mentioned is at present the most interesting, but no explanation is attempted of the remarkable predisposition to pneumonia observed in the recent epidemic of influenza. Drs. Sturges and Coupland believe, however, that the "frequency with which lung inflammation follows influenza is too great to be accounted for by predisposition merely, and argues an affinity between the two as yet, in our opinion, unexplained."

The chapter on pathology is, paradoxical as it may seem, the most interesting to the clinician, and the least so to the mere pathologist. This is due to the facts that the book is, as its name implies, a clinical study, and that clinicians, *i. e.*, those whose knowledge of the natural history of

diseases is greatest, are slowest to accept doctrines concerning their nature and mode of transmission.

A review of the evidence, clinical and etiological, that pneumonia is a specific disease, leads to the conclusion that "there is much in its support. But, in face of the fact that more than one kind of organism has been claimed to be causative of the disease, and of the comparatively recent discovery of such pneumonic microbes, we may be pardoned for withholding an unqualified assent to the proposition that pneumonia is a germ disease."

Under the head of etiology several interesting cases bearing upon the vexed question of contagion are reported, and the conclusion reached that "there is less clinical evidence of the occurrence of pneumonia by contagion than there is for its origin from exposure, from sewer-gas, from want of food, even from mental and bodily depression, and, if it be granted that any of these agents may possibly provoke pneumonia, it may be doubted whether it is further necessary, in order to satisfy the facts, to make any large appeal to this origin by contagion."

The subject of treatment is discussed in a philosophical manner, and begins with a history of methods which have at various times been employed, recommended, superseded, and abandoned. There is no specific and no one remedy universally applicable. The alleviation of pain and of cough, and the reduction of excessive pyrexia, are frequently-recurring indications. For the last-mentioned purpose the different antipyretics, such as antipyrin, antifebrin, and other allied drugs, are not recommended, the author's experience with them not having been favorable. Facts are given which tend to prove that the application of ice to the chest not only relieves pain and reduces temperature, but exerts a generally beneficial action upon the course of the disease. The indications for and against the use of digitalis, opium, and bleeding, are clearly and positively stated, and are based solely on personal experience.

Without entering into further details, although there are several to which interesting reference might be made, we will conclude our notice of this excellent monograph with the words with which it also concludes: "We are content with the adoption of means which have the advantage of obvious reasonableness, resting not on the shifting sand of to-day's therapeutics, but on broad principles of conduct universally recognized and understood."

F. P. H.

THE SHADOW-TEST IN THE DIAGNOSIS AND ESTIMATION OF AMETROPIA.

By W. M. BEAUMONT, Surgeon to the Bath Eye Infirmary. Pp. 40.
London: H. K. Lewis, 1899.

THIS monograph presupposes "a general knowledge of the use of the ophthalmoscope;" and "to make the book as practical as possible" the optical explanation of the shadow-test is omitted. As to the test, therefore, little remains to be said except bald description, and rule-of-thumb directions as to how to apply it. The omission of any optical explanation is the more unfortunate because the study of the subject on the part

of the author, that its introduction would have entailed, might have saved him from such meaningless statements or errors as the following: "According to the position of the image, whether in front of or behind the nodal point of the eye under observation, will the shadow move when the mirror is rotated." Or "The shadow produced by the plane mirror will be found to move in exactly the opposite direction to that produced by the concave mirror, excepting only in very low degrees of myopia."

Again, we find it here repeated: "The surgeon should be aware of any ametropia that may exist in his own eyes before practising the shadow-test." Now, there can be nothing said against the surgeon knowing his own ametropia before he does this or anything else. But the obvious implication, which alone makes the sentence relevant, is that there is some especial reason for such knowledge in the case of the shadow-test, which is exactly the opposite of the fact. Then, too, the other venerable error that to use the plane mirror "the observer should be seated more than four metres from the patient," gets duly or unduly reiterated.

These latter errors were pointed out in this journal more than five years ago. Yet one or the other of them reappears in half the articles upon the subject that have been published since, showing conclusively a very imperfect practical acquaintance of their authors with the subject. Such a state of affairs is not peculiar to the literature of the shadow-test, though here well illustrated.

E. J.

THE THROAT AND NOSE, AND THEIR DISEASES. By LENNOX BROWNE, F.R.C.S.E., Senior Surgeon to the Central Throat and Ear Hospital, Surgeon and Aural Surgeon to the Royal Society of Musicians, Consulting Surgeon to the Newcastle Throat and Ear Hospital, etc. With one hundred and twenty illustrations in color and two hundred and thirty-five engravings designed and executed by the Author. Third edition, revised and enlarged. 8vo., pp. 716. London and Philadelphia: Lea Brothers & Co., 1890.

THIS new edition of Lennox Browne's well-known and admirably devised work on the throat now includes in text as in title the subject of the nose as one of its principal subjects instead of an accessory one merely as in the previous editions. Our review of the second edition having appeared so recently, and there being nothing to modify the good opinions then expressed, our present notice will be confined to the chapters on the Diseases of the Nose. They begin with the general pathology of nasal and naso-pharyngeal diseases, discussing the anatomy of the tract and its accessory cavities, and of the olfactory and respiratory regions of the nose, with physiological considerations as to their importance in breathing, in speaking, and in exciting reflex phenomena adjacent and at a distance. A special classification of the diseases of these structures is presented, based respectively, as to the intra-nasal tract, on the morbid condition of the mucous membrane, and of the osteo-cartilaginous framework and the septum, and on new-growths, whatever their points of origin; which are subdivided and resubdivided so as to include the many varieties of morbid conditions met with. While it may not suit every systematic writer, this classification is excellent in

its way, and not too diffuse. Thus, acute rhinitis may be simple or non-specific; specific from syphilis, diphtheria, gonorrhœa, glanders, etc.; and neurotic rhinitis as in hay-fever, which, with Sajous, he prefers to term periodic hyperæsthetic rhinitis, and in pseudo hay-fever, that variety due to exciting agents other than pollen. In the treatment of acute rhinitis the author has for some time used nothing but menthol inhaled into the nose or applied by spray, brush, or inhaler, or by light tampons of menthol wool. Camphor similarly used has been in commendation for more than a generation. In this connection an extensive note is appended describing the characteristic properties of menthol, which is strongly recommended in several other connections. Atrophic rhinitis is believed to be often a primary affection as far as regards any pathological process in the nose, although the pathological change may be really due to a morbid diathetic state of the system. Two other factors are regarded as excitants: abnormal patency of the anterior nares with an upturned condition of the nose, and the pretty constant inhalation of an insanitary atmosphere. In treatment, great success is claimed from occasional light searings of the atrophied tissues with the electric cautery so as to set up active granulation, and the topical use of stimulating inunctions, as of iodoform, iodol, or menthol.

The subject of deviations and deformities of the septum narium has been much amplified; the author concurring with the views of those writers who believe that traumatism is the most important factor in the production of septal deviations, and with those of Dr. Holbrook Curtis, of New York, as to a causal relationship between anemia and nasal stenosis.

In the treatment of these conditions, Mr. Lennox Browne seems to have become a convert to the surgical methods of treatment first largely practised in New York, with the saw of Bosworth and the trephine of Curtis. Concerning the latter he states that he knows of no innovation in modern rhinological practice to which he has been so much indebted for the relief of hard nasal obstructions. Forceful dilatation of the nasal passages with strong forceps-like contrivances devised by Hewetson, Dundas Grant, and Hill respectively, to correct deviations of the septum, is spoken of favorably, even though the procedure sometimes crushes the turbinate bones and fractures the outer wall of the nasal fossa; a practice which, in our opinion, is hardly to be commended on purely theoretical grounds. A number of illustrations are given in connection with the subject under consideration, with brief histories. These, with the additional illustrations in other portions of the work, enhance the instructive value of the volume, so well appreciated by the profession in the prompt absorbance of its second edition. J. S. C.

ÉTUDE D'HYGIÈNE SOCIALE. SYPHILIS ET SANTÉ PUBLIQUE. Par T. BARTHÉLEMY, Médecin nommé au Concours de Saint-Lazare, etc. Pp. 352, avec cinq planches. Paris: Baillière & Fils, 1890.

SOCIAL HYGIENE, SYPHILIS, AND PUBLIC HEALTH. By T. BARTHÉLEMY.

THE well-known author of this little work has devoted several years to the study of syphilis in its relations with the public health, and the

result is a treatise exhibiting a careful and comprehensive survey of the entire subject. He devotes a chapter to the methods of dissemination of the disease outside of clandestine prostitution, and, in a review made with tolerable care of the subject of early and late inherited disease, reproduces many of the facts so carefully formulated in the lately published treatise on the same theme by his master, to whom indeed this little book is dedicated, the great Fournier. The concluding chapters of the work are devoted to the measures adopted for the regulation of prostitution in France and elsewhere, the police codes of several countries being minutely considered.

Viewed as a whole, the work may be described as belonging to that singular class that are exotic when transplanted outside the Gallican peninsula, and which are bought as curiosities by most physicians of Anglo-Saxon birth, when they care to purchase them at all. The scientific questions discussed in such works are usually more exhaustively and critically considered by other writers, and the quasi-scientific themes introduced are handled usually with the mannerism of a journalist. For example, it would not be difficult for an English or American writer to produce a serious work on syphilis in its relation with social hygiene, and to give in its pages a fairly satisfactory exposition of the features of the disease as recognized by leading syphilographers; but it assuredly would be quite difficult to find one who would be willing to insert among its illustrations a poor woodcut of a young woman carrying overflowing beer-glasses to the customers of a French brasserie under the gas-lights with the title beneath, "*L'Inviteuse*." Or to give other illustrations such semi-popular titles as "*L'Invalide de la Syphilis*," the greater part of the portrait reproducing merely a forlorn-looking man in a dressing-gown and easy chair. Or to give to the illustrations of inherited syphilis the odd title, "*Un Héritage*." For, let it well be understood, our author is a competent, careful, and scientific writer, far removed from the class of men who commonly produce works of this class in the English tongue, and whose consequent positions are not without criticism. M. Barthélemy is, in fact, a native of France, and an honored member of the French faculty in the French capital. This is the whole story.

Without taking the time and space to discuss here anew the oft-vexed question of the regulation of prostitution, it is not without interest to note that our author, in common with so many who have before him embarked on the voyage over this pestilential pool, while sounding a specious appeal in behalf of the "innocents" of infection, betrays the shadows of an education completed on the wrong side of the British Channel. He practically admits the need of sexual gratification for the unmarried man. He quotes with apparent approval the well-known lines inscribed by Voltaire at the base of a statue of "*Amour*":

"Qui que tu sois, voici ton maître;
Il l'est, le sera, le doit être!"

He is apparently as unacquainted with the ideal of a pure manhood, sustained by almost every public utterance on the subject by his neighbors in the United Kingdom, as of the fruitlessness of all attempts at reform by washing the "outside of the cup and the platter." He, in fact, has not the vision to appreciate at its full value a principle which is so potent in all morals that it has set the English-speaking races in the forefront of civilization, swept the French people down before the

mercy of German battalions, settled their future as a nation of second order only, made their literature in many places a cesspool, and produced some, well—"queer" treatises on medicine. J. N. H.

A HANDBOOK OF DISEASES OF THE NOSE AND NASO-PHARYNX. By JAMES B. BALL, M.D. (London), M.R.C.P., Physician to the Department for Diseases of the Throat and Nose, and Senior Assistant Physician, West London Hospital. 12mo., pp. 243, illustrated. London: H. K. Lewis, 1890.

THIS is an admirable handbook in size and in context; and is remarkably free from egoism. It presents in concise, clear, and unredundant terms a fair exposition of the accepted theories of the present period in etiology and in pathology. The treatments advised in connection with the maladies discussed are such as befit the judicious conservative physician. There is an absence of extravagant commendation of special methods of manipulation and operative intervention. We are glad to recognize a due appreciation of one old topical remedy considerably neglected of late years for new ones, the much undervalued silver nitrate. Modern methods of treatment are by no means ignored, however, but their applications are properly restricted within closer limits than is the fashion with the majority of recent writers in text books, in monographs, and in the journals.

Beginning with a synoptical description of the anatomy of the regions and their physiology, chapters immediately follow on general diagnosis and on the methods of topical treatment. Then the cutaneous affections are discussed and the various forms of disease of the mucous membrane and of the intermediate structures. A modest collection of formulæ and an index conclude the volume.

We have no hesitation in commending this handbook as a preliminary study for the medical student and the young practitioner. They will find little to unlearn when their studies are extended to more thorough and extensive treatises, and will have learned much to enable them to recognize the limits of legitimate interference. J. S. C.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

THE DOSAGE AND ADMINISTRATION OF CREASOTE IN PHTHISIS.

DR. WILLIAM H. FLINT has recently brought before the New York Clinical Society the results of his experience with the use of creasote in seventy-three cases of phthisis, among which there were examples of all stages of the disease. Medical opinion is at present almost unanimously favorable to the use of pure beechwood creasote in phthisis, and convincing proofs of the efficacy of this remedy have been furnished by many authors on both sides of the Atlantic. Its use in heroic doses has been advocated by Professor Sommerbrodt, acting upon the assumption that enough creasote may be given so to charge the blood with the remedy as to antagonize the development of tubercle bacilli; and after Guttman had shown that tubercle bacilli could hardly be cultivated in sterilized serum containing $\frac{1}{4000}$ volume of creasote, and that the culture could not be carried on if the solution were a little stronger than 1 in 4000.

Dr. Flint's cases were divided into three classes: 1. Those in which creasote inhalations were alone employed. 2. Those in which the drug was administered both by inhalation and by the stomach or the rectum. 3. Those in which the drug was given only by the stomach or the rectum. Neither of these methods invariably furnishes the best results. The inhalation method was most successful for patients whose gastro-intestinal tracts were diseased, while the other methods were more satisfactory in cases whose digestive organs were in a fairly healthy condition. The solution used for inhalation was always that containing equal parts of creasote, alcohol, and chloroform, a combination very acceptable to patients, save in a few cases in which it caused nausea and gastric distress whenever employed. The inhalers used were Dr. Robinson's and that of the Brompton Hospital. In mild cases the inhalations were administered for fifteen minutes every two or three hours;

in severe ones, every hour during the daytime and every three hours at night. From ten to fifteen drops were placed upon the sponge about every five hours during the day and twice during the night. For administration by the mouth or the rectum an emulsion was used composed of cod-liver oil, 40 parts, and mucilage of acacia, 60 parts, each drachm containing two minims of creasote. In suitable cases the emulsion was given every two hours, and the dose increased up to the point of toleration, which, in the majority of cases, was about ten or twelve minims per diem. If the patients could be persuaded to adopt temporarily an exclusively milk diet, the creasote emulsion was administered in milk, being thoroughly mixed with the latter by means of energetic shaking with a lemonade-shaker such as is used by bartenders. In this way gastric symptoms were least readily excited. Rectal injections of milk containing the creasote emulsion were also found valuable. When the rectum becomes intolerant, laudanum may be added to the enema.

It is important that the treatment be uniform and uninterrupted, and the best results for each individual attend the administration of the maximum quantity of creasote which the patient will bear. If any channel is intolerant, another should be employed, in order not to interrupt the continuity of the treatment.—*New York Medical Journal*, vol. lii. No. 4, 1890.

[The possibility of causing renal irritation or of increasing any existing disease of the kidney by the continued use of creasote should not be lost sight of.—Ed.]

TWO CASES OF POISONING FROM SMALL AMOUNTS OF ATROPINE.

For a lad of twelve years DR. OWENS prescribed two or three drops of a solution containing two grains of atropine to the ounce of water to be instilled into the eyes three times within an hour on a Thursday morning, and again three times during that day, three times during Friday, and once on Saturday. Of these ten instillations the last two were omitted by his mother, as the boy seemed strange on Friday afternoon. When seen by Dr. Owens on Saturday he had all the symptoms of atropine-poisoning, staggering, unsteady gait, dryness of throat and tongue, picking at imaginary objects, muttering, smiling, and occasionally laughing outright to himself. He could be aroused for a few moments so that he would answer questions, but soon relapsed. The face was slightly flushed; there was no rash; the pulse was small and rapid. Pupils were only moderately dilated, and responded but slightly to light. In a few days the patient was all right.

The second case was that of a remarkably healthy gentleman of seventy-three. In order to see if his cataract was mature up to the periphery, two or three drops of a two grain-to-the-ounce solution were instilled three times in about twenty minutes. The pupil dilated readily, and after finishing the examination he spoke thickly and did not answer questions readily. He got up to walk and fell back in the chair, and soon became almost unconscious. Paralysis was so complete that he was quite helpless, and had to be carried to the carriage, his face becoming suffused, and the body covered with an erythematous rash; the pulse could scarcely be counted.

These cases are of interest, first, for the small quantity of the drug that in each case produced such severe effects; secondly, the different toxic symp-

toms produced. In the old man's case paralysis came on rapidly and was complete, whereas in the younger patient the paralysis was less marked, the tetanic symptoms being most prominent, coming on eighteen hours after.—*Lancet*, vol. ii. No. 9, 1890.

MOTOR PARALYSIS RESULTING FROM HYPODERMIC INJECTION OF ETHER.

For the hypodermic injection of ether there are two generally recognized methods: it may be injected subcutaneously into the cellular tissue immediately under the skin, or it may be injected deeply into the belly of the muscle. By the former plan a little emphysema may be produced by the rapid volatilization of the ether. If we inject deeply into a muscle, there is no pain, but there is risk of a deep-seated abscess forming. As ether is a good antiseptic the risk of this latter accident is small.

DAVID WALLACE, F.R.C.S., in reporting upon this subject, reports two cases in which injections of ether were used to treat sudden or threatened collapse; in each case twenty minims of sulphuric ether were injected deeply into the extensor aspect of the forearm. Next day the patients had paralysis of the extensor group of muscles of the forearm supplied by the posterior interosseous nerve.

In one of these cases the patient had not fully regained the use of the hand after nine weeks.

In the other case the patient was too ill for a week to have any attempt made to treat the paralysis; after this blisters, massage, and galvanism were used. The muscles supplied by the posterior interosseous were not only paralyzed but markedly atrophied. After three weeks' treatment the wasted muscles were found to have greatly increased in bulk and firmness. Eight weeks from the date of the paralysis, and after four weeks of galvanism, the middle and ring fingers could be voluntarily extended, and a week later the little finger could be extended, while slight abduction of the thumb was got by the action of the extensor ossis metacarpi pollicis, and extensor secundi internodii pollicis.

It is improbable that the nerve-trunk of the posterior interosseous was pierced by the needle, and the ether injected directly into the nerve, as normally the nerve-trunk would be situated about three inches above the point where the needle was introduced. The ether used was tested and found to be a good preparation. The explanation would rather seem to be that the ether after injection would diffuse most rapidly through the intermuscular spaces, and as it is in these that the nerve-branches chiefly lie, the ether coming into contact with these branches would cause coagulation and destruction of the constituents of the nerves, and in that way destroy their conducting power. The immediate local effect would probably be followed by some degeneration of the nerve going to a higher level, while neuritis would be set up as indicated by the pain felt by the patient during the first three or four weeks of the paralysis.

Such cases as the above are rare, but there seems to be no doubt that paralysis may be caused by the injection of ether deeply into the muscles, that the prognosis is favorable though recovery may be long delayed, and that galvanism hastens the cure.

The possibility of such an accident should teach us to pinch up the skin and inject subcutaneously rather than deeply into a muscle, unless it be the deltoid or gluteus maximus.—*Edinburgh Medical Journal*, No. 423, 1890.

HYPNOTISM IN THERAPEUTICS.

In view of the recent enthusiasm for hypnotism on the part of some of the profession, the warning of DR. KERR, President of the Society for the Study of Inebriety, is well timed.

Dr. Kerr saw in hypnosis only a disordered cerebral state, an abnormal psychical condition with exaltation of receptivity and energy. After all only a limited number of persons are susceptible to it; the after-effect was a disturbance of mental balance, a dissipation and exhaustion of nervous energy. Though suffering was sometimes temporarily assuaged by hypnotic suggestion, the underlying disease was not necessarily cured. The few cases he had seen apparently benefited would probably have yielded to ordinary treatment, but the patients resisted or were passive to that, while they looked forward to, believed in, and gave themselves up to the mesmerizer. Such cases would show a proportion of successes to the "faith-cure," "mind-cure," or any other cure. The greatest success of hypnotism was claimed in nervous diseases, which, however, were the very ailments Dr. Kerr had seen in the long run intensified and confirmed thereby. In inebriety or narcomania, no medical expert of repute had found hypnotism of any value. He had found its pretensions fallacious, its apparent benefit less frequent than that of sound scientific therapeutics, and at times only fostering the true inebriate diathesis. But he employed, as did every intelligent physician, non-hypnotic healthy suggestions of a safe, straightforward, reliable, and scientific character.

Dr. Kerr strongly deprecated public mesmerism, medical, philanthropic, or commercial. He preferred that the medical profession should set its face against the whole practice as a hazardous and unreliable remedy, never free from the risks of perilous sequelæ, liable to the gravest abuses, operative with only a limited number of patients, and the general tendency of which was inimical to the best interests of physician and patient.—*British Medical Journal*, No. 1547, 1890.

THE ACTION OF SALOL ON THE KIDNEYS.

This question has recently been investigated by DR. HESSELBACH, from both experimental and clinical standpoints, and the results have a very practical interest. Salol is a drug intended to take the place of quinine and salicylic acid, which at first was recommended as entirely free from noxious properties. Its drawbacks and dangers remained to be discovered by clinical observation. It was first prepared by von Nencki in 1883, and was introduced into practice by Sahli in 1886. It is the phenylic ether of salicylic acid, and as is well known can be split up into components, phenol or carbolic acid (some 40 per cent.) and salicylic acid (some 60 per cent.), by the pancreatic juice, and to a less extent by the saliva, by the action of bacteria, by organic tissues, and by alkaline carbonates. These components are eliminated from the body, probably as phenyl-ether sulphuric acid, and salicyluric acid. Its

decomposition and elimination from the body take place somewhat rapidly; for half an hour after the administration of 30 grains of salol, salicyluric acid can be detected in the urine; but the complete elimination of its components requires a much longer time. For days after its ingestion (in one case five days) the dark-green or even blackish tint characteristic of carboloria is observable. The result of this slow excretion is that when salol is given continuously its components are apt to accumulate in the system, and give rise to medicinal and even toxic effects of an enduring kind. The action of salol is doubtless due entirely to the phenol and salicylic acid into which it is broken up, though Sahli surmises from the fat-like chemical character of salol, that in large doses it may be absorbed without decomposition. Even if this were so, however, it is by no means impossible that it would be split up in the tissues if not in the alimentary canal.

There have been two opposing views in regard to the risk of using salol, but unquestionable carbolic poisoning has been reported as following the use of large doses, and Dr. Hesselbach gives details of a case which terminated fatally.

The patient was a servant, twenty-two years old, stout, and somewhat anæmic, with no hereditary disease, and hitherto healthy, except for frequent headaches and swelling of the feet. On May 18, 1888, she was seized with acute articular rheumatism, for which she had salicylate of sodium, which relieved the pain, except in the ankle.

On June 8th she received 120 grains of salol within eight hours; she became unconscious and died on June 12th. On June 10th, no urine having been passed since June 8th, eight and a half ounces of pale yellow, slightly turbid urine were drawn with a catheter, in this were detected traces of albumin, salicyluric acid, and phenol.

The chief changes discovered at the post-mortem examination, which are reported in detail, were in the kidney. The epithelial changes suggested strongly an acute exacerbation. Inasmuch as the dangerous symptoms which preceded death followed immediately on the ingestion of 120 grains of salol, it seems justifiable to infer that the case was one of salol-poisoning, which lead to the epithelial changes, and ultimately proved fatal.

Why did the salol prove so exceptionally toxic, while in other cases it has shown itself innocuous? Is the salol chargeable with the toxic action, in particular the action on the kidney? Is it the phenol or the salicylic acid, or both of these? A series of experiments was instituted, beginning with an investigation as to the action of phenol on the kidney; this substance being the most apt to produce such changes, and was followed by an investigation of salol and salicylic acid.

The large number of cases of nephritis from carbolic acid which have now been put upon record prove that the drug is a renal irritant. Although, therefore, there were already numerous data in existence pointing to the action of phenol on the kidney, it appeared necessary to have recourse to experiment in order to discover the way in which the action took place in one and the same species of animal, and to compare the resulting microscopic preparations from different species. On examination after death there appeared hyperæmia and œdema of the pia mater, anæmia of the kidneys, especially of the cortex, and fatty changes (degeneration) in the cortical tissues.

That phenol, apart from its cerebral effects, should chiefly attack the kidney is due to the fact that in this organ its transformation into the innocuous phenyl-ether sulphuric acid takes place. That this is so, may be inferred from the analogous case of benzoic acid, which is changed into hippuric acid within the kidney. The excretion of phenol takes place through the epithelium of the convoluted tubes, and as this is damaged in the process, here also its transformation into phenol-ether sulphuric acid will be at least delayed and act as an irritant. Disease of the kidney, especially of the renal epithelium, must be unfavorable for the elimination of phenol, and so constitutes a predisposition to toxic effects when the drug is administered and a contra-indication for its use.

In the next series of experiments salol was administered to rabbits. The microscopic appearances were essentially the same as those seen in phenol-poisoning, everywhere the fatty degeneration of the epithelium of the convoluted tubules was unmistakable. That salicylic acid frequently gives rise to untoward and dangerous symptoms, especially in relation to the central nervous system, is well known; its action on the kidneys has, however, been less frequently described. Chopin has found that in aged patients it readily gave rise to albuminuria, also in chronic renal disease it acted as a diuretic, and increased the albuminuria.

After giving salicylic acid to rabbits the chief thing found in the kidneys on microscopical examination was the existence of hæmorrhagic extravasations in the interstitial tissue and the renal tubules, and not a destruction of the epithelial cells.

Comparing, then, the renal changes produced by phenol and by salicylic acid respectively, the former, as we have seen, leads to anæmia of the kidney and acute fatty degeneration of the epithelium of the convoluted tubules; the latter to hyperæmia of the kidney and hæmorrhage into the interstitial tissue and the tubules, followed by comparatively slight epithelial degeneration. Phenol acts primarily on the cortex, attacking the medulla only when given in large doses; salicylic acid affects chiefly the medullary portions, and only when in large quantity extends its action to the cortex. As regards the lethal doses the comparison is less precise, inasmuch as the mode of action of the two drugs is very different. Six grains of phenol (per pound) in five days proved fatal, while twenty grains of salicylate of sodium (per pound) were necessary, and killed the animal in two days.

These observations appear to make it clear that the renal changes in salol-poisoning are chiefly due to the phenol it contains. After the use of salol, anæmia of the kidney and acute fatty degeneration of the renal epithelium showed themselves; the cortex was the chief seat of the change, the medulla being but little affected. Only when the dose of salol was large did distinct traces of hæmorrhage appear in the medulla and the medullary rays of the cortex. In other words, only after large doses of salol did the toxic effects of the contained salicylic acid become apparent.

But closer examination shows that the several morbid changes were by no means proportionate to the respective amounts of the two constituents of the salol, whence it may certainly be inferred that not the whole amount of these constituents were concerned in producing the toxic effects observed. Probably a considerable proportion of the salol is absorbed or eliminated unde-

composed. Which constituent is most potent in producing the symptoms of the salol-poisoning is hard to determine with certainty, as the symptoms produced by the one are not unlike those produced by the other. But even in this respect the action of phenol seems to prevail.

In Dr. Hesselbach's patient the contraction of the kidney and the morbid changes in the secretory mechanism thereby induced doubtless account for the fatal effect of the 47 grains of phenol contained in the salol ingested. Phenol-poisoning may occur much more readily if the renal epithelium is already diseased than if the kidneys are sound. Further, Küster has observed that phenol, and, therefore, salol, is especially toxic to anæmic or febrile patients of the female sex, and the death of this patient becomes intelligible.

The following are Dr. Hesselbach's conclusions :

1. The large proportion of phenol contained in salol renders it so toxic a substance that its unrestricted therapeutic use is fraught with danger.
2. In renal disease, acute or chronic, salol is contra-indicated.—*Practitioner*, Nos. 265 and 266, 1890.—*Fortschritte der Medicin*, Nos. 12 and 13, 1890.

THERAPEUTICS OF SOME URINARY DISORDERS.

In comparing the various systems of which the human body is built up, such for instance as the nervous, respiratory, circulatory, digestive, and urinary, the last especially enjoys a condition for the action of drugs which is not equally shared by the other systems, except, perhaps, the digestive system. DR. REGINALD HARRISON devotes a part of a clinical lecture to a consideration of the uses of certain drugs in urinary disorders.

The power of quinine in connection with operations on the urinary organs has long been recognized, and there can be little doubt that this is directly associated with the fact that it is so largely eliminated by the urine.

Dr. Palmer, of Louisville, Kentucky, found that he could so sterilize the urine by the administration of boracic acid in ten-grain doses as to prevent the occurrence of urethral fever after such operations on the urethra as internal urethrotomy. The power of sterilizing the urine so as to render it innocuous when placed under conditions where otherwise it would be liable to generate septic influences is not limited to boracic acid and quinine. Hypophosphate of soda in half-drachm doses, in some purulent affections of the urinary organs may owe its beneficial effects to its influence as a bactericide.

Dr. Harrison has used pichi during four years in the form of a fluid extract, in drachm doses of the latter, with considerable benefit. In renal colic and the passing of calculi through the kidneys and along the ureters, attended with hæmaturia; though not exercising any solvent power, it seems by its action on the tissues in some way to favor the escape of the stone and thus suppress bleeding; it has been found useful also in the hæmorrhage which frequently accompanies cancer of the bladder. The sedative action of the drug on the mucous membrane of the bladder has proved beneficial in many instances of irritability connected with a large prostate. After the bladder has been properly cleansed by irrigation and disinfected, it has been frequently found that the calls to urinate were far less urgent when the pichi was being used.

Acting somewhat similarly, though less astringent in its properties and, therefore, of less value when there is hæmorrhage, is an extract prepared from the berries and fruit of the saw palmetto (*Serenoa serrulata*); it seems to act something like pareira and is a good substitute for it. Of the chemical products, saccharin, in half-grain doses, is useful in preventing the ammoniacal change in the urine in cases of cystitis. Where the mucous membrane of the bladder throws off large quantities of mucus and the urine undergoes rapid ammoniacal decomposition, the urine may become healthy and acid under the use of saccharin, and on discontinuing the drug the urine will speedily return to its original condition. Hence, it may be found useful in readily providing against conditions which cannot be radically altered. Dr. Thomas Stephenson and Dr. Woolridge have shown that saccharin may be taken for a considerable period without interfering with the digestive or other functions of the body.

Another chemical product is borocitrate of magnesia, prepared by dissolving a natural borate of magnesia, found at Strassfurt, in citric acid. It forms a white powder with a sourish taste, and is given in teaspoonful doses in a tumbler of warm water two or three times a day. Its employment has been advocated by Dr. Kochler, in cases of uric acid calculi and gravel. The discharge of these bodies, whose presence has previously been suspected, has frequently taken place after the use of this salt. It may be, all it does is to secure that the individual shall take at stated times more fluid than perhaps he would otherwise do; an important point, upon which Sir William Roberts has laid stress. Dr. Harrison is disposed to think that it does more than thus induce a person to flush his kidneys with a bland fluid by no means disagreeable to take, and that it is capable of modifying or altering the crystalline form in which uric acid is discharged and of exercising a solvent power on some kinds of urate stones.—*The Medical Press*, No. 2671, 1890.

HYPNOTICS.

FOLSON has given an excellent and practical outline of the use of hypnotics.

Their use is recommended in acute disease, particularly fevers, where sleep is often a necessity. In chronic disease there is frequently the same temporary need. In incurable diseases with pain and discomfort, in the restlessness of senility, hypnotics and narcotics—used freely in the last years of life—are almost the chief justification of our service. Often in mental disease they are, for a time, all but indispensable. In some neurotic people their occasional use can hardly be avoided. In acute nervous and mental disturbance from profound shock, full and continued doses of narcotics may dispel most threatening symptoms.

The chief indications in insomnia are: to give hypnotic drugs rarely and only when other measures have failed; to use, as far as it is possible, the small dose, repeating as needed, so as to avoid the over-action or the cumulative effect of large doses; to be satisfied with the least amount of sleep that is safe, if produced by medicine; to avoid drugs as a rule, except for euthanasia, when the mental condition is not such that all the after-effects can be noted; to bear in mind the fact that hypnotics given to produce sleep

may increase wakefulness; to be on guard for unpleasant or toxic results, when any drug is given in sufficient dose to produce prolonged and profound sleep; to give the large dose when it is indicated; not to expect the same action or tolerance of new medicines in sensitive private patients as in hospital practice.

The advantages of spirits, wine, beer, ale, porter (including some of the so-called malt extracts), koumyss, matzoon, are well known in old age, in conditions of exhaustion, fevers, and generally where a cardiac depressant must be avoided, especially if supplemented by vasomotor stimulants, like ergot, digitalis, strychnine, coca, cocaine. A glass of champagne often acts like magic in the sleeplessness of a dilated heart. But the habitual necessity of alcohol to produce sleep in brain-workers indicates the nearness of the danger-line. The disadvantages of alcohol are well known and readily guarded against.

The preparations of opium are indispensable in many cases with pain, in old age, in many forms of heart-disease.

The bromides diminish the reflex excitability of the medulla, and are vasomotor excitants. Their best therapeutic effect, always avoiding bromidism, is obtained as hypnotics, from divided doses given through the day or evening, whether in large quantity or small. Alone, or combined with other medicines, they have a wide usefulness. The debilitating influence from them may in some cases be, partly at least, met with iron or bark. By virtue of obstructing the heart's action and producing a certain amount of muscular depression, they are not without objections for continued use, or, in some cases, occasionally.

Paraldehyde has a much less depressing action on the circulation and respiration. It is especially valuable in conditions of mental excitement, where the duration of sleep may be prolonged by adding morphine. To get a definite hypnotic effect, the dose must be increased. Its acrid taste and the disagreeable persistent odor from the breath are objections to its use, and even when largely diluted it is often objected to on the ground of its being a gastro-intestinal irritant. The temptation to its habitual use is less than in alcohol, morphine, cocaine, and chloral, the symptoms produced being tremor, confusion, impaired memory, diminished intelligence, etc.

Amylhydrate appears to stand in hypnotic power below chloral-hydrate, and above or below paraldehyde, according to different observers, but with even less depressing action on the heart than the latter. The toxic effects from it, of nausea, headache, weak pulse, are less marked than in paraldehyde, and it is less a gastro-intestinal irritant, although sufficiently so to require often its administration by rectum.

Urethan, a mild hypnotic in doses of twenty grains, is at times useful, and may, from its ready solubility, be given hypodermically. It is without especial depressing action on the heart, except in enfeebled persons. It has, like all rather mild remedies, proved in some cases uncertain in its effects, but is useful, and ordinarily without disagreeable after-effects.

Hydrobromate of hyoscyne has a limited usefulness, especially in maniacal excitement, violent hysteria, delirium tremens, insomnia with agitation, in the insane and aged. In a certain proportion of cases there is no quieting effect from the drug, but the restlessness is increased.

Chloralamide is best given in a slightly acid solution, with spirit, or as an elixir, thereby sufficiently disguising its bitter taste. The danger from a large dose is less than from a large dose of chloral. Disagreeable after-effects are less common. Some observers value chloralamide highly, while others regard it as in no way deserving especial praise. Sulphonal is a less powerful hypnotic than chloral, with even less influence on pain, but without so much, although with slight, depressing action on the heart. From its difficult solubility, the physiological action is slowly produced; a single dose may be efficient for two successive nights, and there is risk of the cumulative effect if the dose is too often repeated. In doses of thirty grains or less it is in the main safe, although twenty grains given each night for several weeks to a girl of sixteen, produced stupor, and twenty grains, three times a day continuously, to a strong male adult, caused ataxia, tremor, and mental apathy. It has been found not always certain, and in over-action, with an after-effect of somnolence, fatigue, depression, lack of appetite, which, from an overdose, may amount to semi-coma and cardiac depression. Given in doses of five grains, and repeated, if necessary, two or three times, or of ten or twenty grains, and perhaps repeated, it has proved in his hands a hypnotic of great value in producing sleep which is refreshing and natural. When care has been taken not to give it too often or in too large doses, he had never seen any untoward results from it.

It is the most important and widely useful of the new hypnotics. Phenacetin may be given in wafers and compressed tablets, as a powder or with brandy. In the insomnia of overwork or nervous irritation, in febrile states, or from headache, it is a hypnotic of great value, in doses of five to ten grains, repeated if necessary. In sleeplessness of intense neuralgia, less than fifteen grains, repeated two or three times, as needed, is not likely to be effectual, the fact having been first ascertained that there is no intolerance to the drug. —*Boston Medical and Surgical Journal*, July 10, 1890.

MEDICINE.

UNDER THE CHARGE OF

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TETANY.

JAKSCH (abstracted in *Centrbl. f. d. med. Wissensch.*, 1890, 24, 441) has during four years observed 41 cases of tetany; 36 of which were in males and 5 in females. It is most common between the ages of seventeen and eighteen years, at least in males, though the women affected were between twenty-six and forty-seven years old. The males belonged principally to the class of artisans; the majority being shoemakers, then carpenters, tailors, etc. The

disease appeared most frequently in the winter and especially in the spring months. Hereditary conditions and preceding infectious diseases appeared to possess no influence. Although the upper extremities were those in which the spasm predominated, the lower were in the majority also attacked. In one case the left lower and the left upper extremities were the only ones attacked. In some cases the masseters were also involved, and the tongue was thick and exhibited muscular twitchings, as did other muscles of the body. The most important and most constant symptoms of tetany were the irritability of the facial nerve and the production of contraction by pressure on the arteries and nerves of the limb. In regard to the relation of the motor apparatus to electrical stimulation the author's observations agree with those of others.

He found the patellar reflex present in all cases except two, ankle-clonus in no instance, and the cremasteric and abdominal reflexes usually increased. The average duration of the disease was two to three days. In 18 of 36 cases there were relapses, often several. The author found fever of intermittent or remittent type in 9 out of 35 men with the affection, and a subnormal temperature usually followed this. Respiration remained, as a rule, unaffected; the pulse-rate was somewhat increased during the fever. The author considers these symptoms due to the action of a poison whose nature is not yet determined. He describes certain cases as acute relapsing tetany, distinguished by their rapid cyclic course from the more frequently observed chronic cases, among which there are occasionally observed very severe instances. Cases of this latter sort occurring in the course of grave cerebral diseases should, like athetosis, be considered as showing symptoms of cerebral irritation.

TRAUMATIC TETANUS OCCURRING IN THE COURSE OF TYPHOID FEVER.

BELHOMME (*Arch. de Méd. et de Pharm. Milit.*, 1890, No. 6, 464) refers to the rarity of the combination of tetanus with a microbic disease, and reports two instances of its association with typhoid fever. His search through medical literature has disclosed no other instances of this combination. The first case, briefly reported, occurred in a man who, having a wound on his finger, developed typhoid fever, and died after fifteen days with the symptoms of tetanus. The second case, a patient under the author's own observation, was a man of twenty-five years suffering from typhoid fever, who fell from a window while semi-delirious and received several wounds. About eleven days after this accident the symptoms of tetanus developed and increased until terminated by death. The etiology was interesting in this instance. The patient, being a cavalryman, was in constant contact with horses, and wore clothes impregnated with their sweat, and may have acquired the tetanic infection in this manner; or it may have been through the contact of his wounds with the earth on which he fell and which was rich in manure. Bacteriological inoculation-experiments made with the earth from the place on which the patient fell appeared to prove beyond a doubt the telluric origin of the disease in this case. It should be noticed that the first case also occurred in the person of a cavalryman.

The author claims that these two observations put beyond doubt the possi-

bility of the simultaneous appearance of typhoid fever and tetanus in the same individual, and without their exercising the slightest influence upon each other.

THE PHYSIOLOGY AND PATHOLOGY OF SLEEP; WITH OBSERVATIONS ON NONA.

MAUTHNER (*Intern. klin. Rundschau*, 1890, 949), in discussing the various pathological processes whose most prominent symptom is sleep accompanied by extreme muscle-weakness, divides these into those of a more chronic or subacute course, and those of a very stormy acute form. In the first category belong:

1. The "endemic morbid somnolence of the negroes," which is followed by death in the course of two to three months. The symptoms are general apathy and depression, the most extreme muscular weakness without motor paralysis and with intact sensibility, a staggering gait, and constantly increasing somnolence until the power of motion is entirely lost, and the motionless sleep lasts until the fatal end.

2. "Gayet's disease," as illustrated in the case described by Gayet in 1875, the symptoms, course, and termination of which possess a close resemblance to the "maladie du sommeil," and which is of especial importance in that an autopsy was obtained.

3. "Gerlier's disease," occurring in the form of small epidemics in Switzerland, and described by Gerlier under the name of "*vertige paralysant*." The symptom of somnolence is less prominent in this affection than are the vertigo and extreme muscular weakness, rendering young, powerful stablemen unfit for any labor.

4. The "*Attaque du sommeil*" of hysterical persons, the duration of which may be several months without ending fatally.

All of these more chronic forms—with the exception of the tropical form, of which the author has no certain knowledge in this respect—have a striking focal symptom in common; viz., ptosis with paralysis of the ocular muscles.

The acute forms are represented by the following:

1. "Wernicke's disease," whose symptoms are, from the beginning, a combination of ocular paralysis, staggering gait, and somnolence, or else a final stage of somnolence after preceding agitation.

2. Unusually long sleep after intoxication, in which the individual may sleep—as in one case under the author's observation—as long as five days, during which time it is impossible to wake him.

3. "Nona," in case this disease actually exists. The possibility of the existence of this affection cannot be denied, since Morbus Wernicke, occurring epidemically or endemically, would end in death the third or fourth week, with somnolence as its most prominent symptom.

The nature of both the chronic and the acute forms of morbid somnolence is undoubtedly that of a *poliencephalitis superior*. The inflammation of the central gray cavities of the third ventricle, the gray matter of the walls of the aqueduct of Sylvius, and that of the floor of the fourth ventricle, give as the most constant general symptoms, general apathy and depression, with exces-

sive muscular weakness, and, in a more advanced stage of the disease, extreme somnolence; while as a result of the extension of the process to the nuclei of the nerves, the focal symptom of ocular paralysis appears.

Basing his opinion on clinical experience and on the pathological appearance in disease of the central gray cavities, the author proposes a theory for the cause of physiological sleep. This theory is, that sleep is to be considered as an evidence of tiring of the central gray cavities. Through the temporary suspension of the function of this portion of the brain, both the centripetal and the centrifugal nervous paths communicating with the cortex are cut off. Consequently sensory impressions are not conducted to consciousness, although the sensory organs on the one hand, and the cells of the cerebral cortex on the other, have not suspended their function. In the same way the motor centres are normally innervated in dreams, but on account of the interruption in the conduction in the central gray cavities, no motion is produced in spite of the normal power of conduction of the peripheral nerves. Finally the focal symptom of ocular paralysis is not absent; for the falling of the eyelids in those becoming sleepy is a true ptosis, while the simultaneous occurrence of double vision indicates the marked disturbance of innervation of the external ocular muscles.

SIX CASES OF FRIEDREICH'S ATAXIA OCCURRING IN THREE DIFFERENT FAMILIES.

G. W. ROOK and C. L. DANA (*Journ. Nervous and Mental Diseases*, 1890, 173) report the histories of six cases of Friedreich's ataxia occurring in three different families. The first case was that of a boy of twelve years. His father had suffered with ataxia during the last ten years of his life, and there were other spinal troubles in his family. The patient showed no symptoms of the disease until about a year previously, when his gait became awkward and irregular, and he frequently stumbled, especially in the dark. When examined by Dana, six or more months after, there was an ataxic gait, made worse by closing the eyes, and he could not stand with his eyes shut. He had no pain, spinal curvature, nystagmus, characteristic affection of speech, local atrophies, affection of vision or of the optic nerve. The knee-jerks were present. There was dorsal flexion of the right great toe, and slight tactile anæsthesia of the right foot. The urine and the electrical reactions were normal.

In the second case, also seen by Dana, the disease first developed when the patient was fifteen years old, after a blow on the head, and was associated with polyuria and disturbance of speech. When examined, at the age of twenty-one, the ataxia and peculiar rolling gait were very marked.

The four remaining cases were under the care of Rook, and were all of the same family. In the family history the only predisposing causes discoverable were phthisis and alcoholism. Of eight children, four were ataxic. The first of these, a female, aged twenty, had an attack of measles in her eleventh year, and began in the same year to experience a sense of weakness in the lower limbs, and a staggering gait. In her twelfth year the arms were likewise affected. At the time of examination there was kypho-scoliosis, double talipes valgus, a claw-like appearance of the hands, and an expressionless

appearance of the face. The speech was tremulous and slow, the disposition somewhat irritable, acts of cerebration were performed with an effort. There was no paralysis, but decided atrophic changes in the muscular system, and the electrical reaction was much less than normal. She was unable to stand or walk without support, and the movements of the arms became more ataxic when the eyes were closed. Cutaneous sensibility was diminished. There was no pain, but numbness was experienced. Vertigo was present at times. There were no ocular symptoms. The superficial reflexes were diminished, and the knee-jerks abolished.

The second case, a male, aged sixteen, began to exhibit a staggering gait in his eleventh year, and affection of the arms about one year later. When examined there was found kyphosis, a very ataxic gait, occasional attacks of syncope, normal nutrition, slow tremulous speech, but little affection of intellect, spasmodic painless contractions of the lower limbs, diminution of the electrical reactions of the muscles, vertigo, diminished cutaneous sensibility and plantar reflex, and abolished knee-jerk. There was no paralysis or atrophy. The ataxia was made worse by closing the eyes, and under this condition he could neither stand nor walk.

The third case, a girl, aged fourteen years, began in the same way and at the same age as did the others. When examined, her gait was very ataxic, and the motions of her arms nearly equally so. Station became worse when the eyes were closed. There were kyphosis, double talipes valgus, wrist-drop, claw-like hand, palpitation of the heart, fever due to disease of the lungs, slow and tremulous speech, diminished electrical reaction of the muscles, frequent attacks of vertigo, occasional numbness in the limbs, diminished plantar reflex and abolished patellar reflex, diminished cutaneous sensibility, marked muscular atrophy, some nystagmus, no paralysis, and no pain.

The last case, a girl of nine years, was only beginning to exhibit symptoms of the disease. Speech was slow but not tremulous, ataxia of locomotion or station was only apparent when the eyes were closed. In the excitement of play, or with the eyes shut, the motion of the arms become slightly ataxic. There was no atrophy, contractures, paralysis, or alteration of the electrical reaction; tactile sensation was diminished, the plantar reflex nearly normal, but the knee-jerk greatly diminished.

The treatment employed in these four cases was silver nitrate, cod-liver oil, and suspension. The first and third cases improved, but no alteration was noticed in their ataxia. The second case improved in his gait, but not in his reflexes or tactile sense. In the fourth case, no increase of the ataxia was observed during six months of treatment.

HEREDITARY CHOREA.

In reporting several cases of different nervous disorders, BOWER (*Journ. of Nervous and Mental Diseases*, 1890, 131) records three of hereditary chorea. The first occurred in a negro, aged thirty-six years. His mother, with her two sisters and one brother, suffered from the same affection. In the mother the disease developed at the age of twenty-six, and gradually grew worse until she died of exhaustion at the age of sixty-eight. In the aunt and

uncle it appeared probably between the ages of twenty and thirty-five years. One of the aunts was dead; in the uncle the arms alone were affected.

The patient, who had been a hard drinker, became suddenly paralyzed in the lower extremities at the age of twenty-eight, but recovered after three months. At thirty years of age twitching of his hands began, and spread slowly, until the whole body became affected. When examined, he exhibited constant choreic movements of the upper extremities, with swaying of the body in walking, and pseudo-ataxic movements of the legs. The movements were not increased by voluntary efforts, but seemed to be by excitement. When sitting he was less unquiet, though still moving. His speech was slow; his handwriting was fairly good, but accomplished only with great effort to keep himself in proper position. His mental condition did not appear to be impaired.

A second case is assigned by the writer to this category on the ground that it appeared to have the symptoms of Huntington's chorea, though there was an entire absence of a history of heredity. The patient, aged thirty-two, began to have twitching and weakness in the upper extremities about three years before, followed in about three months by involvement of the head and legs. When examined it was found that while sitting the legs and feet were usually quiet, though there was a constant almost rhythmical motion of the head, occasional restless movements of the arms, and constant irregular athetoid motion of the fingers and hands. On walking the choreic movements were everywhere much increased, and the gait exhibited a peculiar twisting, half-rotating movement of the trunk and limbs. Voluntary effort, such as writing, caused the movements to become less marked, but excitement greatly exaggerated them. Speech was slow; the tongue could not be fully protruded, and seemed to be not entirely controllable. Knee-jerk and muscle-jerk were considerably exaggerated, and there was slight ankle-clonus.

The father of the third case was affected with the same disease as the patient herself, and her baby of four months of age had almost constant choreic movements of both hands. The patient, aged forty-one, began to have slight twitchings when about thirty-six years old, and these gradually increased. The study of the case showed that the movements of the head, arms, legs, and speech were affected much as in the other cases described. The right side was much more markedly disordered than the left. There was slight beginning dementia.

INFECTIOUS ICTERUS.

DUCHAMP (*Rev. de Méd.*, June, 1890, 483; 520) says that beside the classic catarrhal icterus, of which the source is the influence of the seasons, gastro-intestinal catarrh or emotional disturbances, there has been coming into prominence the doctrine of an icterus which is to be considered as a general disorder, the result of an auto-intoxication or an infectious element coming from without. The author has seen certain cases which seem incontestably due to the latter cause, and which constituted a limited epidemic of icterus.

About the last of the month of May an obstructed sewer had been opened for cleaning one of the streets of Montpellier, and black filth of a nauseating

odor was taken from it. Although this remained exposed to the sun but a very short time, and from the outset was disinfected with chloride of lime, yet six of the workmen, who had been employed for different lengths of time, were taken sick; three with icterus, two with gastro-intestinal disorders, and one with simple malaise.

In the three cases of icterus, the details of which are reported, the symptoms appeared much the same in all.

In examining the causes which could have possibly produced the icterus, the author finds that the only one common to all the cases was the participation in the cleaning of the sewer. He believes that the six workmen came into contact at some period with a telluric element of infection, a mephitic substance from the filth; and that this, finding in three of them a favorable soil, gave birth to the disease.

The author shows that the affection could not be some other infectious disorder merely complicated by icterus, but that the icterus was itself the infectious disease; it was, namely, an essential infectious icterus. Although the cases which he reports had no initial headache, no herpes, no fever with relapse, no microorganisms in the blood, no amelioration by crisis, yet they cannot be considered as essentially other than instances of the affection first described by Landouzy as *ictère grave*, then by Mathieu as hepatic typhus, and later studied by Weil, and going under his name.

The author prefers the title "infectious icterus." It indicates the clinical nature of the malady, and is, besides, a general term, and therefore appropriate, since all the cases of infectious icterus have by no means a perfect resemblance. If the author wished to adopt a classification of the varieties of cases seen, he would range those which he now describes under the category of "benign polycholic infectious icterus."

As with other infectious diseases, infectious icterus has periods of incubation, invasion, and decline. The period of incubation is believed by him to have been five days in the cases he observed. The invasion was marked by a serious condition of the general health, extreme depression, moderate fever, severe myalgia increased by pressure on the muscles of the lower limbs, and sometimes vertigo and epistaxis. Only in the second case was fever observed, lasting three days, and gradually diminishing. Intense polycholic icterus was the most characteristic symptom of the affection. Nasal and cutaneous hæmorrhages were observed. The urine was albuminous in one case. The gravity of the general state of the patient was especially to be noted. No alteration in the condition of the spleen or liver could be detected. This period of the disease lasted about two weeks. The period of decline was indicated by diminution in the degree of icterus, though the general condition might improve before or after this. The period of decline lasted three to four weeks, and was attended by a tardy convalescence, and a diminution in the size of the liver.

The author admits that the penetration of a volatile ptomaine into the organism might produce all the symptoms described, but claims that the long period of incubation indicates that the disorder is caused by a microbe.

In the same number of this journal SIZARY describes a case under the title of Weil's disease. The patient, a butcher, was suddenly attacked by sore-throat and fever. The following day there were prostration and depression.

Two days later subcrepitant râles developed in the chest, and the action of the heart became rapid to a degree out of all proportion to the temperature, while the urine contained albumin. After about a week icterus developed; the liver became enlarged; the spleen remained apparently normal, and the patient complained of tearing pains in his arms and legs. The tongue was coated, the appetite lost. About the tenth day a scarlatiniform eruption appeared upon the buttocks and in the groin, and lasted about three days. The fever disappeared after about fifteen days, but the patient continued very feeble for several weeks more.

The author is of the opinion that the infection in this case was probably introduced by way of the inflamed tonsils. Not only did the symptoms resemble those described by Weil, but the fact that the patient was a butcher by trade rendered the diagnosis still more probable, since the disease appears to have a predilection for men of this profession. The author is convinced that Weil's disease is an infectious one, and believes that the presence of the disease among butchers offers a certain presumption that the infectious agent is a microbe of animal origin. The immoderate use of alcohol, as in the case reported, perhaps predisposed the organism to the attacks of the infectious agent.

OBSERVATIONS ON THE MOVEMENTS OF THE INTESTINE IN MAN.

ROSSBACH (*Deutsch. Arch. f. klin. Med.*, 1890, xlv. 323) says that there is, as far as he knows, only one case described—that of Busch—in which there had been an injury to the intestine from which the patient had recovered, and which yet permitted satisfactory observation of the intestinal movements. This was a case of abdominal hernia with an artificial anus in the upper part of the small intestine. Through this abnormal opening the movements of the intestine under various conditions could be well seen.

The author has been fortunate enough to find an individual, a woman, suffering from constipation and movable liver, whose abdominal parietes were so remarkably relaxed and thin that the movements of the bowel could be observed with accuracy. Careful study of these, with the graphic plotting of curves representing them, seemed to render certain observations beyond doubt.

1. In the early morning hours the intestinal peristalsis as well as the gastric movements appeared to be at rest.
2. As soon as food is taken into the empty stomach and passes thence into the intestine an evident peristalsis begins, alternating with intervals of quiet. Sometimes the movements begin within a quarter of an hour.
3. No difference could be perceived in the intensity of action of different articles of diet upon the intestinal movements; except that coffee, whether taken fasting or after the midday meal, almost always produced the strongest peristalsis.
4. In general the irritability of the intestine appeared to have grown very slight by evening, since often no peristalsis was to be observed either immediately or a long time after the ingestion of the evening meal.
5. Except as mentioned, there appears to be no regularity in the intestinal peristalsis. The movements may be present before, during, or after a meal,

may be marked or slight, may develop at once after eating or only after one to two hours.

6. The peristaltic motion never lasts long with the same intensity. Large waves alternate with small ones, or with intervals of rest.

These observations apply to the intestine under the influence of ordinary nourishment only. The author has examined also the effect of various agents upon the movements with the following results:

1. Slight degrees of cold, as the mere exposure of the abdomen, produce peristalsis after a few minutes, or strengthen it if already present.

2. Greater degrees of cold, as sprinkling the abdomen with cold water, likewise increase the peristalsis only in slight degree.

3. The drinking of cold water produces at once a lively peristalsis.

4. Rubbing of the abdominal walls has no effect.

5. Moderate pressure in the space between the two *recti abdominis* is followed by an unusually active movement.

6. Pressure and squeezing of the intestine itself produce no movement.

7. After coughing the peristalsis becomes evidently stronger during a considerable time.

8. Through pressing [evacuation of the bowels] an increased peristalsis is produced.

9. Respiration does not cause an active peristalsis to cease, but a prolonged holding of the breath does have this effect, though the movements return later.

10. Purgation, accomplished by means of enemata, develops very violent peristaltic movements, accompanied by rumbling and distention of the abdomen.

11. One to two drachms of castor oil taken internally have no effect upon the bowel during the first half-hour, but then develop active peristalsis combined with rumbling in the abdomen.

12. Intense sensations of hunger always occasion active peristalsis.

13. The excitement of the emotions (as moderate fright, the sudden refusal to allow the patient to eat when hungry, etc.) causes the immediate disappearance of peristalsis, even when strong. After five to ten minutes the movements return.

14. The employment of electrical irritation produces very varying results. (a) The faradic current supplied to different parts [as shown in an appended table] brought out or strengthened peristalsis in a few cases, but its action was very inconstant. (b) The galvanic current [as also shown in a table] in like manner usually produced no or but slight peristalsis, and only in a few instances when applied through the rectum succeeded in developing active movements.

BACTERIOLOGY IN THE PROGNOSIS AND TREATMENT OF PURULENT PLEURISY.

NETTER (*Rev. Gén. de Clin. et de Thérap.*, 1890, No. 21, 341) has examined the effusion in 109 cases of purulent pleurisy, and has found a large variety of bacteria. Thus he has observed 51 cases in which the streptococcus was present; 32 with pneumococci; 14 characterized by the association of different species

of microbes, and 12 instances of tubercular pleurisy. In the first three forms the histological examination and the cultures have shown what organism was concerned, while in the fourth the tubercle bacilli were often found in the pus by microscopical examination, although they might be absent. The failure to find tubercle bacilli does not justify the conclusion that the pleurisy is not tubercular, since inoculation of the peritoneum of rabbits with the pus sometimes gave positive results.

Clinical experience has shown that the pleurisy occasioned by pneumococci is much the most benign. It is most frequent in children, it often terminates by vomica. The pus should be removed by repeated aspirations before practising incision as a last resort.

Pleurisy from streptococci is more serious and more frequent in the adult. It is the type of classic pleurisy, and it is in cases caused by it that there is the greatest need for surgical intervention. The pleural cavity ought to be emptied very early by thoracotomy, and the organisms which have developed upon its walls should be destroyed by the employment of a powerful antiseptic, such as sublimate; for without this treatment the germs are reproduced with great ease in the places where they have not been disturbed, and thence infect anew the pleural surface. There are, however, cases of pleural effusion due to streptococci which have recovered spontaneously after one aspiration. But as bacteriological methods do not determine the virulence of the streptococcus in a given case, it is better to employ early interference by thoracotomy.

Putrid pleurisies demand the same early interference. They may heal without fistula.

Tubercular purulent pleurisies do not heal by incision, but are improved by aspirations performed at long intervals.

CARCINOMA OF THE PANCREAS.

N. G. RICHMOND (*Buffalo Med. and Surg. Journ.*, 1890, xxix. 728) reports a case of primary cancer of the pancreas. The patient, a man of fifty-six years, had been in poor health for some years, and had suffered from tenderness over the epigastrium with occasional attacks of bilious colic. For some months he had at intervals passed from the bowels what he described as "soap." The ingestion of fats in the food increased this, while starchy foods controlled it. The peculiar stools came liquid from the bowel, and when cool formed solid plates of a golden yellow color, which could be moulded like wax. They covered the feces, and were not mixed with them. A tumor the size of a fist was found in the epigastrium, extending transversely from the region of the gall-bladder to the left of the median line. Emaciation, pain, and loss of appetite increased; digestion was attended by a burning sensation; jaundice was present at times.

The autopsy showed a cancer of the head of the pancreas with a general breaking-down of the whole of the organ. The outer wall of the duodenum, the liver, spleen, and lesser curvature of the stomach were involved to some extent. The growth surrounded and occluded the common bile-duct.

Of the fifty cases of cancer of the pancreas which the author has been able to collect the most prominent symptoms have been: emaciation; pain; jaun-

dice; fatty, chalky, or clay-colored stools; tumor in the epigastrium. The pain in this disease is more continuous than in cancer of the pylorus, and radiates in more directions. Jaundice is common, due to the surrounding of the common bile-duct by the cancerous mass. The emaciation has been noted in every case, and is attributed by the author to the robbing of the system of the fats which the pancreatic juice is accustomed to saponify.

As regards fatty diarrhœa, it has been claimed that this symptom is pathognomonic of disease of the pancreas. The author, however, concludes from his study of the reported cases, that though it is, when connected with tumor in the region of the pancreas, a strong argument in favor of the existence of cancer of the organ, it yet is absent in the majority of cases. He agrees with those who hold that there is no symptom pathognomonic of pancreatic cancer.

An aid in differentiating the disease from tumor of the pylorus is that it is more obvious in the recumbent position, since in the erect position the liver and stomach come over it. A full meal also helps to make it disappear.

The duration of the affection is from one to two years.

Of the different varieties of cancer of the pancreas scirrhus of the head of the gland is the most common; encephaloid next in order; and cylindrical-celled epithelioma the least frequently seen.

Treatment consists simply in relieving pain, meeting symptoms as they arise, and in the use of an easily-digested and easily-assimilated diet. Artificial digestives are to be recommended.

SURGERY.

UNDER THE CHARGE OF

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ACUTE STRANGULATION OF THE INTESTINAL WALL.

SCHAEFFER (*Deut. med. Woch.*, No. 27, 1890) reports two cases of Littre's hernia, both of which were operated upon, and terminated favorably. In commenting upon these cases, Schaeffer notes that in neither was there intestinal obstruction. Indeed, the diagnosis was made from the fact that, together with the symptoms of strangulated hernia, there were repeated spontaneous passages of gas and feces.

According to Laurents, who has observed twelve cases of this form of hernia, obstruction develops nearly always in Littre's hernia; the evacuation, if observed, depending rather upon dislodgment of fecal masses lying in the bowel beyond the seat of constriction than upon preservation of the continuity of the intestinal canal.

The cases reported, however, passed flatus and solid matter repeatedly and spontaneously, and operation was indicated only by concomitant symptoms. This is an important observation, since a dependence upon Laurent's method might lead to unwise postponement of operative interference.

INTUBATION.

URBAN (*Deut. Zeit. f. Chirurgie*, Bd. 3, 1 u. 2 Heft, 1890), in a careful study of thirty-two cases of intubation performed for the relief of dyspnoea dependent upon diphtheritic laryngitis, was compelled to supplement this procedure by tracheotomy in eighteen instances. Three times on account of difficulty in administering nourishment, eight times because intubation was not successful in relieving dyspnoea, four times on account of the tube suddenly becoming stopped by membrane, once because œdema of the glottis prevented introduction of the tube, and twice because both the administration of nourishment was interfered with and the dyspnoea was not relieved.

Of the thirty-two cases where intubation was practicable, three recovered—all light cases. Of the twenty-nine fatal cases, twelve died of fibrinous bronchitis, four of septic poisoning, three of acute nephritis, one of gangrenous pulmonitis, and the remainder of several of the above complications.

In twenty-one cases the condition of the urine was determined; in only seven was it found free from albumin.

In three cases the tube was coughed up; in one this happened twice, and each time was accompanied by a large tubular membrane. This child recovered. In all the cases there was more or less difficulty in swallowing and difficulty in keeping the opening of the tube free. Two absolutely refused all nourishment until the tube was withdrawn, and tracheotomy was performed.

Urban holds that rest of the inflamed larynx is an important indication not met by the intubation method, that the opening of the O'Dwyer tube is so small and its position so inaccessible that, in the first place, it is exceedingly prone to become blocked; in the second place, none but the physician can relieve the resulting obstruction, and that far from encouraging it hinders expectoration of exfoliated membranes. He grants, however, that in light cases intubation may be a valuable means of treatment, though it must be remembered that the apparently mild cases of the disease may be suddenly converted into the most malignant forms.

OPERATIONS FOR STONE OF THE BLADDER.

As a result of one hundred operations for vesical calculus, DITTEL (*Wien. klin. Woch.*, Nos. 5 u. 12, 1890) finds that of seventy cases of litholapaxy, four died. One of these, however, perished on account of a fatty heart, another from Bright's disease—hence attributing two deaths to the operative procedure gives a mortality of three per cent. The fatal outcome seemed to be dependent upon hypertrophy of the prostate, since the latter was wounded during the operation, and thus the door of septic infection was opened. The essayist finds the danger of wounding the bladder in litholapaxy is comparatively slight, the urethra being much more commonly injured. Recidivity,

probably dependent upon imperfect evacuation of the crushed stone, was observed five times in litholapaxy. It must be remembered that, even when the aspirator evacuates no fragments of the calculus, this is no certain sign that none are remaining in the bladder. A thorough examination with a cystoscope will alone give assurance that every portion of stone has been removed. In the majority of cases, eight to fourteen days after the operation the patient was able to leave the hospital.

Median incision was made in eight cases, once through the vagina into the bladder followed by primary suture, and once into the male urethra for impacted calculus. In the remaining cases the cut was made for the purpose of draining highly inflamed bladders.

Twenty-three cases of the high operation give five deaths, not all of which, however, were directly dependent upon the operation. In four cases primary suture was attempted, but the result was not encouraging. Open treatment and siphon drainage absolutely prevented any urinary infiltration or retention of pus. In old people suffering from paresis of the bladder, after suprapubic cystotomy permanent catheterization by way of the wound was practised with satisfactory result.

SEVERE HÆMATURIA TREATED BY NEPHRECTOMY.

BROWN (*New York Medical Journal*, August 16, 1890) reports a case of hæmaturia treated by nephrectomy. The trouble occurred in the person of a woman who had given birth to a child four months before. Hæmaturia developed suddenly, and was very marked. There was pain in the right kidney, and fever reaching 105°. Suddenly at the end of five days the symptoms disappeared, though there still remained a dull pain in the right side and thigh. Five months later there was a second attack, the woman at the time being two months pregnant. After a sudden lifting motion she experienced sharp pain in the right side; twenty minutes later the urine was found charged with blood. The bleeding was so abundant that the clots prevented micturition and had to be mechanically removed. The recovery was as sudden as in the first case. The third attack occurred two months later. On examination there was tenderness on pressure between the twelfth rib and the crest of the ilium. Incision was made, but a thorough search, both by palpation and by means of exploratory needle, failed to detect any calculus. The kidney was removed, and the patient recovered entirely. Examination of the kidney showed some submucous infiltration and the ordinary microscopic appearance of a chronic pyelitis of mild grade.

NOTES ON ONE HUNDRED CASES OF OSTEOTOMY.

HAGYARD (*Lancet*, June 14, 1890) reports the results of one hundred cases of osteotomy performed for the relief of a great variety of surgical complaints, and mostly at the homes of the patients under unfavorable hygienic surroundings. There was not a single case of septic infection, nor was any death recorded. Bony union was obtained in every case without difficulty. Two accidents happened—namely, the breaking off of a chisel on two different occasions—in the case of a man, aged twenty-eight, after cutting through the femur, one-eighth of an inch of a chisel was left behind. This was never

found. Troublesome abscess subsequently developed, but the case ultimately healed. In the second case of this kind, the fragment was never found, but gave rise to absolutely no trouble.

The dressings consisted of a pad of salicylic silk, the wound first being closed with chromicized gut and dusted with iodoform.

In one instance six compound fractures were made, the deformity being unusually pronounced. The operator commenced this case by fracturing both thighs, removing small wedges, and, at the same time, doing simple osteotomy at the upper third of the tibiæ. Two months later the tibiæ were again divided, and wedge-shaped pieces removed from the junction of the middle and lower thirds. The result was perfectly satisfactory. The after-treatment consisted in the application of light steel support on the outer side of the limb.

Many cases were also treated by splints, bandages, and surgical appliances. Among the milder means, the author warmly commends attempts at forcible straightening under chloroform. The anæsthetic is administered once a week in these cases, and after efforts at reducing the deformity, well-padded splints are carefully applied.

HEALING OF A COLD ABSCESS BY IODOFORM INJECTION.

Very rapid healing of a large tubercular abscess, due to caries of the ribs, under treatment by iodoform injections, is reported by KERSCHNER (*Prag. med. Woch.*, No. 28, 1890). For a year the patient had complained of pain in the right pectoral muscle, and after six months swelling was noticed, which gradually increased until it involved the greater portion of the right side of the chest.

From the history of the case, it was evident that this abscess was due to caries of the three upper ribs and the sternum, and to tubercular ulceration of the sterno-costal joints. The patient refused to consent to radical operation, therefore incision was made into the abscess, a pint and a half of pus was evacuated, and the cavity was treated by injecting an ounce and a half of a solution made of iodoform, 10 parts, glycerin, 50 parts, and water, 100 parts. This injection was repeated twice. In two weeks the abscess was entirely healed. The treatment was conducted throughout under the most rigid antiseptic precautions.

Lately it has been much more common to use olive oil as a solvent, or, at least, as a suspending menstruum for iodoform. In this relation, it is interesting to note that KLINGEMANN (*Centralblatt f. Chir.*, August 9, 1890) reports a series of observations to determine the solubility of iodoform in olive oil. He finds that at the most the oil will not dissolve more than 3 per cent. of iodoform. From this, it follows that the 10 per cent. and 20 per cent. solutions, so frequently advised and used, contain the greater portion of the drug in suspension.

THE PRESENT POSITION OF ANTISEPTIC SURGERY.

The address delivered before the International Medical Congress at Berlin upon this subject (*British Medical Journal*, August 16, 1890), coming as it does from LISTER, the father of modern surgery, is of world-wide interest.

The theory of phagocytosis is carefully discussed. The essayist accords his full support to the well-known views of Metchnikoff upon this subject. It is by means of this theory that he explains the successful results following abdominal operations at the hands of those who disclaim antiseptic methods. He advises the use of weak solutions of bichloride of mercury, 1:10,000, for washing out the abdominal cavity. He states that his practice for some time past has been, in ordinary surgical operations, to wash the wound, after securing the bleeding points, with a strong solution of corrosive sublimate, 1:500, and to irrigate with a weaker lotion (1:4000) during the stitching. When the operation involves a joint, however, the synovia of which is healthy, 1:500 sublimate lotion produces so much irritation that its use is not desirable. In these cases a solution of 1:4000 is as strong as can be safely employed. In so far as the spray is concerned, Lister states that he feels ashamed that he should ever have recommended it for the purpose of destroying microbes of the air. The advisability of dispensing entirely with irrigation, and consequently with drainage, since the free flow of serum necessitating the use of tubes is mainly due to the irritant effect of the antiseptic lotions, is discussed by the author; and, though he has not yet adopted this practice in his own surgical work, yet from the general tenor of his remarks, he clearly favors it.

In conclusion, Lister expresses entire confidence in his recently-described cyanide of mercury dressing.

SURGERY OF THE LATERAL VENTRICLES OF THE BRAIN.

Three cases of operation for the relief of effusion into the lateral ventricles, performed by the reporter, together with two cases communicated by Mayo Robson, are reported by KEEN (*Medical Press and Circular*, August 20, 1890).

The first case, a boy aged four, was threatened with blindness from acute hydrocephalus. For the relief of central pressure, an operation was performed and puncture was made at a point one inch and a quarter behind the left meatus, and the same distance above "Reid's base-line." A half-inch button of bone was removed, and the brain punctured by a hollow needle inserted in the direction of a point two and a half inches vertically above the opposite meatus. At about an inch and three-quarters the resistance suddenly ceased, and the cerebro-spinal fluid began to flow. The ventricle was drained by horsehair.

In two days the swelling of the optic nerve, which had been noted before the operation, was markedly diminished. This improvement continued until the seventh day, when the swelling increased.

The symptoms strongly indicated the presence of a tumor; this was sought for by probing, through the opening made for drainage, into the occipital lobe. This failing, a small opening in the occipital bone below and to the left of the inion was made. The cerebellum was thoroughly explored by means of a probe carried to the depth of over two inches, but no tumor could be detected. At the end of the second week horse-hair drainage was substituted by a rubber tube. At the end of four weeks, the symptoms having increased in severity, the right side of the skull was trephined, and the occipital lobe

was punctured to the tentorium, but no tumor was found. The right ventricle was then drained.

Twice during the subsequent course of the case the ventricles were irrigated, the liquid passing from one side to the other. On the forty-fifth day after the first operation the child died.

A sarcoma was found in the left lobe of the cerebellum, compressing the straight sinus and the veins of Galen, and encroaching on the fourth ventricle. No trace of the many punctures made into the brain-substance could be found. One of these had gone directly through the tumor.

The next case, aged three and a half years, suffered from hydrocephalus, which appeared a few months after birth. The left ventricle was tapped, as in the first case, and some turbid cerebro-spinal fluid was withdrawn. On the fourth day after this operation, the ventricle of the opposite side was opened, and rubber tubes were inserted from each external opening into the corresponding ventricle.

On the next day convulsions set in. The drained cerebro-spinal fluid was replaced by boiled water thrown in from a height of about eight inches. The spasm ceased as soon as the warm fluid flowed into the ventricles. On stopping the flow there was recurrence of convulsions. Eight times these convulsive seizures were arrested by injection of from half an ounce to an ounce of fluid. The child died on the fifth day from the first operation.

The third case was one of tubercular meningitis, with unilateral acute internal hydrocephalus involving the left ventricle. The foramen of Monro was closed. The left ventricle was tapped through the arm-centre. The child died four hours after the operation.

The first case communicated by Mayo Robson was a child aged ten, who suffered first from a discharge from the ear. This had lasted a month when she was admitted to the hospital; there had also been rigidity of the neck and twitching of the right angle of the mouth. On admission to the hospital her temperature was 105° , there was pain on the left side of the head, paresis of the right arm and leg, gradually developing into complete hemiplegia and aphasia. The optic disks were inflamed. The child was trephined not quite three weeks after admission. An opening of the skull was made over the arm centre; the brain on exposure did not pulsate. An exploratory needle was passed in various directions in a search of pus, and was finally pushed into the lateral ventricle, when half an ounce of clear fluid was drawn off, after which pulsation returned to the brain. The wound was closed without drainage, and the following day there was slight power in the arm, on the third day simple questions could be answered. Six months later the child was perfectly well.

The second case was one of increasing hydrocephalus, following the treatment of spinal bifida by Morton's injection. An exploratory needle was inserted into the ventricle, and by means of a pair of sinus-forceps a rubber drain was thrust into this cavity. The amount of discharge was very large. On the third day the child died in convulsions.

A case of removal of clot from the lateral ventricle, by Dennis, is also reported. This resulted fatally, but rather from the injury inflicted upon the brain by the original traumatism, than from any cause connected with the operation of incising the ventricle.

Four cases of abscess rupturing into the ventricle are also given, together with two cases of rupture of the ventricle by compound fracture; both of these last recovered.

Five cases of rupture of the lateral ventricles from simple fracture of the skull, are also noted. This accident occurred in every instance in the person of young children, all of whom showed secondary soft swelling under the scalp. Of these cases three recovered.

After a general review of the subject, Keen draws the following conclusions:

I. Injuries involving the ventricles, the result of compound fracture, or of trephining, and involving greater disturbance of the cerebral substance, are not necessarily fatal, for ten of the twenty-six cases here reported have recovered. In these few cases compound fractures and extensive injuries, unless primarily fatal, seem to be less dangerous than rupture of the ventricle from simple fracture. They should be treated antiseptically, in precisely the same manner as wounds in other parts of the body, by the establishment of asepsis, drainage, and the usual later treatment. If pus follows, or the cerebro-spinal fluid becomes dammed up, causing symptoms of pressure, incision and free drainage should be resorted to.

II. In cases of simple fracture involving the ventricles, experience would seem to indicate that it would be wise not to attempt any operative procedure unless threatening symptoms supervene. If necessary, I should recommend that the cyst containing cerebro-spinal fluid should be continuously and slowly drained by a small bundle of horse-hairs, rather than by free evacuation. But, I believe, in the majority of cases, constant pressure, and but little active treatment, would meet such symptoms as might arise. Possibly slight pressure would be all the treatment that would be necessary.

III. Abscess of the brain bursting into the lateral ventricle has been thus far uniformly fatal, and demands the promptest treatment possible. The suggestion made for instant bilateral trephining and irrigation of the ventricles, can at least do no harm, although the possibility of its doing any good is but slight in so fatal a condition.

IV. Hydrocephalus, whether acute or chronic, is usually a fatal disease.

V. Surgical procedures for tapping the ventricles for its relief are easy, and certainly do not *per se* involve great danger.

VI. Whether they will cure the disease is as yet not determined. In acute effusions tapping, with or without drainage, as may be thought best, will certainly save some lives otherwise doomed to be lost; and in the chronic form long-continued slow drainage at an early date, is at least worthy of a trial, with a reasonable hope of success in a few cases.

VII. The methods which I have described for performing the operation, especially by the lateral route, are at least worthy of a trial, with a view of determining the value of such surgical procedures.

VIII. After trephining and tapping of the ventricles, irrigation of the ventricular cavities from side to side, is not only possible but does no harm. In abscess involving the ventricle, and perhaps in other conditions, it may possibly do good. The fluid used for such irrigation should not contain anything which, if retained and absorbed, might do harm. An artificial cerebro-

spinal fluid, or a simple boracic acid solution, would seem to be the best for such use.

IX. Convulsions due to rapid withdrawal of the cerebro-spinal fluid may be checked by the re-injection of an artificial cerebro-spinal fluid, or such other innocuous fluid as the circumstances may make available.

X. In either irrigation or injection of the ventricles, it is probably desirable that the air should not enter; but such entrance of air does not seem to be productive of mischief.

XI. In hemorrhage in the lateral ventricles, at least of a traumatic origin, instant trephining and evacuation of the clot should be done, and in a few cases will probably be followed by a cure, unless the injury of the cerebral tissue is such as to be incompatible with life.

RUPTURE OF THE SPLEEN.

DARWIN (*Indian Medical Gazette*, June, 1890) reports a case of rupture of spleen occurring in the person of a healthy young man, aged twenty-one, and caused by a fall of moderate severity.

The patient walked one hundred and fifty yards after the injury, then sat down, complaining of strange sensations, vomited, felt exhausted, and looked pale. He quickly became collapsed, had involuntary faecal evacuations, and died in a few minutes.

On performing an autopsy the spleen, which was twice its normal size, was found ruptured; the abdominal cavity was full of blood.

THE TREATMENT OF CANCEROUS STRICTURES OF THE ŒSOPHAGUS BY CONTINUOUS CATHETERIZATION.

GANGOLPHE (*Lyon Méd.*, No. 27, 1890) strongly urges the employment of continuous catheterization in the treatment of cancerous strictures of the œsophagus. Since a definite cure of the disease is practically impossible, the chief indication would be to furnish alimentation without undue disturbance of the seat of malignant ulceration. This end may be attained either by the performance of a gastrotomy and the formation of a gastric fistula, or by the passage of a catheter, which is subsequently maintained in position, and by means of which nourishment may be poured into the stomach. Against gastrotomy, however, stands a very high mortality. According to Lefort, this is 72.8 per cent., whilst Zessas places it at 86 per cent. Even when the patient recovers from the operation he rarely survives upward of a few months.

The reasons for the want of success in gastrotomy are sufficiently evident. There is always a tendency to postpone the operation, since it is a very difficult matter to decide just when narrowing is sufficient to justify such a serious therapeutic measure. Hence, when the surgeon finally decides to make the opening into the stomach, the patient is practically moribund.

Gangolphe proposes to lessen the responsibility of the surgeon by the early employment of permanent catheterization. Nearly always, patients are seen when the disease is not yet far enough advanced to prevent the passage of instruments; but when this procedure is adopted for the purpose of making a

diagnosis, or for the introduction of alimentation, it causes so much pain and so greatly aggravates the local condition that it is not frequently repeated. The narrowing becomes steadily less until the œsophagus is entirely impermeable.

Boyer, in 1799, treated a woman, aged forty-six, suffering from cancerous stricture of the upper portion of the œsophagus, by passing one end of a rubber tube through the stricture, bringing its other end out by the nostril, and keeping it permanently in this position. The patient lived five months, taking all her nourishment through this tube. Krishaber maintained life for nearly a year by the same means. Croft, Gersuny, Kirmisson, together with others, publish similar cases most favorable in their results.

Authorities vary in regard to the advisability of using short or long tubes. The short tubes are made of soft rubber; they are rarely over four to six inches in length, depending upon the seat of stricture. The upper end is somewhat funnel-shaped, and has attached to it two silk threads, which are carried out of the mouth. The tubes are introduced by means of an instrument especially designed for this purpose.

The long sounds, made of red rubber, and reaching into the stomach, are most popular in France. The short sounds, the upper extremities of which remain in the pharynx, allow the patients to taste and swallow their food, but since much of the liquid nourishment is liable to pass along by the side of the sound the latter may, by remaining in the upper portion of the œsophagus, result in fermentation and subsequent irritation. The presence of the long sounds in the pharynx and nasal cavity sometimes gives rise to considerable irritation, but this gradually subsides with time. Occasionally a fever, in every way comparable to the so-called urethral fever, is developed. These are practically the only disadvantages attending this treatment. It is not necessary that one sound should be worn constantly. In fact it is very desirable that the instrument should be changed occasionally, and at times the surgeon has been able to withdraw the tube and allow the patient to swallow without any instrument, again replacing the catheter when symptoms of dysphagia appear.

As to the results furnished by this method, the patients have usually survived from one to eleven months. At first there has always been rapid improvement, followed, of course, by a deterioration as the cancerous cachexia becomes developed. The profound melancholia, and other characteristic features of malignant disease frequently disappear. The weight increases from ten to twenty-four pounds, and the patient becomes physically and morally a new man.

The author advances the following conclusions in regard to the applicability of catheterization.

The permanent catheter is especially indicated in recent cases of cancerous stricture of the œsophagus. Even when the respiratory system is invaded the long, soft catheter can still be employed with advantage, since it absolutely prevents the penetration of food into the bronchi. The existence of abundant hæmorrhage, either spontaneous or excited, is a contra-indication to frequent catheterization, and sometimes even to the employment of a permanent catheter, although the latter may be used for a considerable time without serious accident.

Short canulas may be used in the early stages of the disease, while the long canulas seem more applicable to the latter periods.

Gastrotomy should be reserved for exceptional cases in which involvement of neighboring organs, easily excited and frequently repeated hæmorrhages, or impossibility of catheterization after repeated efforts contra-indicate the use of a permanent catheter.

THE OPERATIVE TREATMENT OF DISLOCATIONS IRREDUCIBLE BY ORDINARY MEANS.

Several cases of dislocation which could be reduced only by operation, are reported by MAYO ROBSON (*The Lancet*, July 26, 1890).

In all these cases the ordinary means of reduction were tried in vain. The joints were then exposed by a free incision, and the normal relation of the bones restored.

In the first case there was an irreducible backward luxation of the elbow, seen four weeks after the injury. The triceps tendon was divided and the joint was opened. It was found that the coronoid process was broken in two parts, one being attached to the tendon of the brachialis anticus, the other to the stump of the coronoid process. The external lateral ligament was torn and displaced, lying between the head of the radius and the capitellum, thus preventing reduction. The dislocation was readily reduced, the triceps tendon was stitched with catgut suture, and the wound was closed and drained; healing was by first intention. Two months later there was a useful movable joint.

The next case was one of irreducible dislocation of the same joint of five months' standing. This was operated on as before, but on account of exuberant callus the head of the radius had to be resected. The function of the joint was perfectly preserved. A supra-coronoid dislocation of the shoulder, six weeks old, a dorsal dislocation of the hip ten weeks old, and a dislocation of the finger three weeks old, were also subjected to operation after failure of the ordinary means for obtaining reduction. Subsequent results were all that could be desired.

In contrast to these cases are reported a number where operation was refused. In all a permanent and very great disability resulted.

OTOLOGY.

UNDER THE CHARGE OF

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NASAL AND AURAL SYMPTOMS IN GRIPPE.

DR. H. NIMIER, under the above title, presents his observations of these processes in the recent epidemic of influenza (*Le Mercredi Médical*, 1899).

In this paper some interesting historical facts pertaining to previous epidemics are given. In 1580, Boeckel noted the occurrence of purulent otitis media in an epidemic of grippe, and in the epidemic of 1729-30, Fuster noted otalgia and sanguinolent otorrhœas following this disease; and again, in an epidemic of 1732-33, he notes the occurrence of acute otitis with purulent discharge, after influenza. In 1835 Ozanam wrote that "sometimes complications arise (in grippe) which render the disease grave and longer in duration, because to the early symptoms, in some cases, are added intense earache and swelling in the parotids and the glands of the neck. At last the disease terminates with a discharge of pus from the ear, and sometimes, though rarely, with suppuration of the parotids." This latter symptom does not seem to have been noticed in the recent epidemic. Nimier then gives some comparative statistics of acute otitis media, as collected in the Val-de-Grâce Hospital, in the service of Professor Chauvel. Thus, in December, 1888, and January, 1889, of eighteen cases of otitis media admitted to the clinic, *six* were acute; while in the same period of 1889 and 1890, of thirty-two cases admitted, *fifteen* were acute.

THE EAR, FAUCES, AND LARYNX IN TABES DORSALIS.

DR. ALESSANDRO MARINA, of Trieste, contributes an article on the above subject to the *Archiv für Psychiatrie u. Nervenkrankheiten*, Bd. xxi. Heft 1, which is reviewed in the *Archiv f. Ohrenheilkunde*, by Szenes, Bd. xxix., 1890. It appears that the author examined the ear in forty tabetic patients, and found twenty-nine cases of disease of the inner ear. In no instance were Ménière symptoms found, and in most instances subjective noises were not present. In seven tabetic women the internal ear was said to have been diseased in three, the middle ear in one, and in two a mixed form of aural disease was found. The author believes that not only the terminal apparatus is affected, but also the acoustic nerve itself, especially when the functional disturbance is great. The auditory changes are the consequences of a more or less pronounced anatomical change, for in most cases anatomical lesions in the central and peripheral organs were demonstrable. In eleven cases electric excitation of the acusticus was essayed, and reactions obtained, excepting in two cases, with a current of from two to eighteen milliamperes. In eight instances the patients evinced a more or less marked hyper-excitability of the acoustic nerve, under the electric stimulus.

CHRONIC SUPPURATION OF THE EAR; CARCINOMA OF THE EXTERNAL AUDITORY CANAL; FACIAL PARALYSIS; MENINGITIS.

LUDEWIG narrates such a case in the annual report of the aural clinic in Halle (*Archiv für Ohrenheilkunde*, vol. xxix., 1890). The patient was a man, sixty-one years old. When first examined in the clinic his left auditory canal was swollen, red, and rough. A yellowish, offensive pus trickled from the fundus of the ear. This ear was very deaf, and painful, the pain radiating over the left side of the head. The appearance of the ear suggested malignant disease. A small piece from the lower wall of the auditory canal was examined under the microscope, and proved to be carcinomatous. While on a second visit to the clinic, ten days later, he was seized with a chill, followed

by a rise in temperature, facial paralysis, and somnolence, which latter persisted until death. There was one more chill and repeated vomiting, death occurring two days later. The post-mortem examination revealed carcinoma of the left external auditory canal; retention of pus in the middle ear; purulent meningitis. Ludewig expresses the very just opinion that a timely operation in this case might have warded off the meningitis, which was due to retention of pus by the swollen and choked auditory canal, and might also have cured the original purulent disease. The carcinoma remained limited to the cartilaginous part of the auditory canal. It would have been well to endeavor to remove the cartilaginous canal and the lining of the osseous portion of the same. This would have prevented retention of pus, and warded off the attack of meningitis.

NORMAL AND PATHOLOGICAL ANATOMY OF THE MIDDLE EAR.

PROF. POLITZER, of Vienna, in a lecture delivered at the International Congress of Otologists, in Paris, alluded to the pathological changes which may occur in what he terms the "external attic,"¹ a space bounded outwardly by the flaccid membrane and the outer osseous wall of the drum-cavity, and inwardly by the malleus, neck and head, and the anvil, above by the superior ligament of the malleus, and below by the short process of the malleus. Various inflammatory processes may arise in this space, viz.: chronic catarrhal processes with new formations of connective tissue are likely to occur, also purulent inflammations, both acute and chronic, this latter being both stubborn and dangerous. There may then be found in this cavity thick exudations or cholesteatomatous masses, and sometimes granulations and polypi, which project from the perforation in Shrapnell's membrane. Not infrequently caries occurs in the hammer-head and in the margo tympanicus.

The treatment recommended consists in injections of antiseptic solutions into the diseased region by means of delicate canulas attached to a syringe. The author had employed 1-3 per cent. solutions of resorcin, and 1:2000 bichloride solutions in this way, which he follows with instillations of a five-per-cent. alcoholic solution of boric acid or of iodol, and in some rare cases a ten-per-cent. solution of nitrate of silver. If the discharge still continues after this treatment, it must be due either to the narrowness of the perforation in Shrapnell's membrane or to the choking of the attic space by synechiæ, or to caries of the head of the malleus and of the margo tympanicus. In such a case the perforation should be widened, and the space cleared of its cholesteatomatous contents. If caries of the malleus-head or margo tympanicus is diagnosed by means of a sound, the diseased portions of bone should be removed. The entire bone is to be removed, according to Politzer, only when the degree of deafness is great. [As chronic suppuration of this space is invariably indicative of caries in the ossicles, there is no cure for it but excision of the membrana tympani and the malleus, and the incus, too, if found diseased—according to our experience.—R.]

¹ The third tympanic pouch of Prussak and of Brunner.

PERMANENTLY GOOD RESULTS OF EXCISION OF THE MEMBRANA TYMPANI AND MALLEUS IN A CASE OF CHRONIC AURAL VERTIGO; ALSO, IN A CASE OF CHRONIC SUPPURATION OF THE TYMPANIC ATTIC.

DR. CHARLES H. BURNETT presented a paper with the above title at the meeting of the American Otological Society, 1890. In it an account is given of a case of aural vertigo (often called Ménière's disease) caused by chronic catarrhal adhesion of the membrana and malleus to the inner wall of the drum-cavity. All forms of rational treatment laid down for such cases failed to relieve the distressing tinnitus and vertigo. As the retraction of the chain of ossicles, induced by the adhesion of the membrana and malleus, was deemed the cause of the tinnitus and vertigo, excision of the adherent parts of the conducting apparatus was performed under ether, with immediate relief, and there has been no return of the annoying symptoms in the two years and four months which have elapsed since the operation.

So far as Dr. Burnett can discover, this is the first case of chronic aural vertigo (Ménière symptoms) reported as cured by an operation such as described. The case, furthermore, proves the mechanical origin, and not a neuropathic one, of some cases of so-called Ménière's disease.

In the case of chronic suppuration of the attic, of six years' duration when first seen by Dr. Burnett, in July, 1888, all forms of treatment by antiseptic injections, etc., into the attic cavity (recessus epitympanicus) failed to cure the purulency, though persevered in for a year. Therefore it was resolved to excise the membrana tympani and malleus, with a view to removal of the diseased malleus head, and also to gain better drainage and a more direct way of medication of the attic. The hearing was *nil* in the affected ear.

Therefore under ether, in July, 1889, the membrana and malleus were excised. The malleus head was found eroded by necrosis on its anterior free surface. Pathological bands were found between the attic and the atrium, forming the floor of a sinus, conducting the pus from the diseased spot to the perforation in the membrana flaccida, and not into the external auditory canal. The purulency stopped in the course of a fortnight, a new membrane began to grow, and finally, in the course of three months, a new membrane had formed. The hearing finally reached *fifteen feet for whispered words*.

TRAUMATIC PARTIAL ELIMINATION OF THE DRUM-HEAD; CLOSURE OF THE DEFECT IN EIGHT WEEKS.

DR. A. EITELBERG, of Vienna, reports a case of the above nature (*Archives of Otolaryngology*, vol. xix., 1890). A man, twenty-eight years old, while carrying a heavy basket into a cellar, let the load slip from his hands and fall against his left temple, pressing the right side of his head against the cellar wall. Immediately blood flowed profusely from his nose and left ear. The next day it was found that the aural hæmorrhage had lasted all night, and still was continuing when the man's ear was examined. The membrana tympani was found extensively ruptured and suffused with blood. The ear was cleared out by syringing. Politzer inflation was performed, and the canal lightly tamponed with iodoform-gauze. The hæmorrhage continued for five days with diminishing quantity. The semi-detached piece of the membrana

became bluish-gray in color and rolled up. On the sixth day this shred became detached, and was syringed out from the ear. It measured 6 mm. by 4 mm. The head of the stapes now became visible, but the handle of the malleus seemed drawn out of sight by the unopposed force of the tensor tympani muscle. In eight weeks a new membrana tympani had formed. The hearing was good, a whisper being heard 110 cm.

PATHOLOGICAL CHANGES IN THE MEMBRANA TYMPANI AND IN THE DRUM-CAVITY IN FATAL MIDDLE-EAR SUPPURATIONS.

WILHELM KIRCHNER, of Würzburg, in a paper on this subject, read in March last at a meeting of the Physik.-med. Gesellschaft of Würzburg, demonstrated the remarkable changes which may ensue in chronic suppuration of the middle ear. In one case, in particular, death was caused by thrombus in the transverse sinus, the latter being converted, as it were, into a solid cord by the complete organization of the thrombus. The membrana tympani was unusually thick, not perforated, but the drum-cavity was filled with pus, the mucous membrane of the latter cavity, as well as that of the mastoid cells, thick and infiltrated. The microscope showed that all the layers of the membrana tympani were thickened, and the vessels and lymph-spaces unusually widened. Furthermore, on the inner surface of the membrana tympani were papilliform and villous growths, with epithelial covering composed of numerous small cells and a few connective-tissue fibres, most numerous in the region of the pouches of the membrana. (Szenes, *Archiv f. Ohrenheilkunde*, Bd. xxix., 1890.)

CASES OF MENINGITIS FROM INFLAMMATION OF THE TYMPANUM.

DR. J. ORNE GREEN reports four cases of fatal meningitis from chronic suppurative inflammation in the drum-cavity. (*Boston Medical and Surgical Journal*, June 19, 1890.) In all of these cases an operation (perforation) was performed on the mastoid region for the evacuation of pus supposed to be pent-up in the mastoid cavity.

Dr. Green says, "All four of the cases are demonstrations of the failure of the operation to avert the fatal result where the meninges have been already infected, however successful the operation may be in cleansing the original source of infection; and this brings up the surgeon's duty in such cases." Two forms of meningitis from inflammation of the ear are found. One is infection by absorption into the circulation, the exact part by which the morbid material is carried from the ear to the meninges not being known; the other is an extension of inflammation *ex contiguo*, from the bone to the dura mater, and thence to the other meninges. The former is a rapid process, and once established is necessarily fatal; the latter is a gradual process, "in its incipieny localized," and, as Dr. Green believes, is occasionally cured.

CONDITIONS OF THE AUDITORY APPARATUS IN TABES.

DR. EUGENE MORPURGO, of Trieste, has published a paper upon the above-named subject based on the examination of the literature pertaining to it, and also upon the observation of fifty-three cases of tabes. (*Archiv für Ohren-*

heilkunde, vol. xxx., 1890, Parts 1 and 2.) There were forty-two men and eleven women in this series. Ten had normal hearing, and forty-three were deaf. There were, in all, one hundred and six ears examined, of which eighty-five were abnormal in hearing, and twenty-one normal—i.e., 81.13 per cent. were diseased and 18.87 per cent. were normal. Thirty-four men were affected in their ears, and nine women.

Of the entire eighty-five diseased ears:

8	heard	.	.	.	.	.	.	.	0
39	"	whispers	.	.	.	.	.	.	0-100 cm.
18	"	"	.	.	.	.	.	.	100-200 cm.
18	"	"	.	.	.	.	.	.	200-400 cm.
2	"	"	.	.	.	.	.	.	400-500 cm.

Of the forty-three tabetic individuals who did not possess normal hearing, fifteen showed changes as detected by the ear-mirror, and twenty-eight appeared normal.

Subjective noises of a trifling form were complained of in eight cases; six times in ears with a membrana of normal appearance, and twice in those of abnormal appearance. Vertigo was present in two cases.

In most of the cases examined the facts observed seemed to show that in general a disease of the perceptive apparatus of the ear was present.

TWO CASES OF CEREBRAL ABSCESS RESULTING FROM LONG-STANDING OTORRHOEA; OPERATION; RECOVERY.

These cases are reported at length by URBAN PRITCHARD, of London; they occurred in the wards of King's College Hospital, under the care of Professors Cheyne and Rose. (*Archives of Otology*, vol. xix., 1890.) The first case was that of a man, twenty-three years old, from whose left ear there had been a chronic discharge ten years, with increasing headache.

When first seen by Mr. Rose he was drowsy and incoherent; there was abundant and offensive purulent discharge from the left ear, tenderness on pressure most marked about two inches above the meatus, and slight facial palsy. The tongue was thickly coated. No absolute optic neuritis; no paralysis of the extremities, and tactile sensation appeared perfect.

The same day Mr. Rose trephined the skull at a spot two inches above and one-half inch in front of the meatus, over the tender area. The dura mater, which appeared quite healthy, was opened, but no pus followed repeated exploratory punctures into the brain-substance with trocar and canula. The trephine was then applied an inch behind the posterior margin of the original opening, and offensive pus was found outside the dura mater, which was left intact. The operation was performed June 23, 1889. By August 20th the man was made an out-patient and left the hospital. On March 27, 1890, his condition was as follows, viz.: "The ear was quite healthy and dry, his general health good, and he did not complain of headache. Since recovering from the operation he has been subject to periodic attacks of aphasia, of about twenty minutes' duration. These attacks at first occurred about once a fort-

night, but have gradually become much less frequent. Except for a certain slowness of speech, the survival, probably, of the imperfect cerebration which was so marked a feature of his convalescence, he is, intellectually, quite clear and vigorous."

The second case was that of a man, twenty-six years old, who had suffered during the last seven or eight years from a purulent discharge from the left ear, and during this period, upon two occasions, was laid up with intense pain in the ear, and upon the last occasion, six months previous to his admission to the hospital, the pain in the ear was attended by swelling in the neck.

On September 7, 1889, he was suddenly seized with intense pain in the ear and left side of the head, and on the next day appears to have had two distinct rigors. On the next day there is a "confused history" of a "fit," but one without twitchings or convulsions.

On the 11th of September he was admitted to King's College Hospital, under Mr. Cheyne. During the first few days of his residence in the hospital there was a complete absence of the cerebral symptoms which characterized the first case. He complained of intense pain in the head, "the focus of which appeared to be over an area of about half an inch in diameter, situated in the left temporal fossa, just above the middle of the zygoma. He was disinclined to get out of bed, and when he did so, was giddy and hardly able to stand. The discharge from the ear was profuse, purulent, and offensive, the left membrana tympani was destroyed, and there were numerous polypoid growths springing from the middle ear. *There was no optic neuritis*, nor paralysis of any kind. On September 14th the temperature rose to 101°, it having been normal before. In the evening there was considerable delirium, and during the night he vomited for the first time. The next day twitching of the left eyebrow and angle of the mouth was noticed, when he became more delirious. Two days later he became very noisy and delirious, the twitching was more marked, there was retention of urine; and he lay in an unconscious, torpid condition. The skull was now trephined at a spot one and a quarter inches behind the meatus, and the same distance above the cerebral base-line. Both bone and dura mater appeared to be quite healthy, but on exploration inward and forward about half an ounce of very fetid pus escaped. The broken-down brain-substance was removed, the whole thoroughly irrigated, a drainage-tube inserted, and the wound closed. There was only a transient relief, the patient becoming delirious again. He had also one or two rigors, and became very low."

On September 24th, a week after the trephining, the mastoid cells were opened, but contained no pus. On October 2d the track of the drainage-tube was freely dilated by means of long, thin, sinus-forceps, which led to the escape of about two drachms of pus. From this time the patient began to improve. The next day his temperature became normal, and remained so. Word-deafness was noticed in this case, as in the previous one, but it was not so prominent nor persistent.

The latter case, so far as the ear is concerned, has not been so successful as the previous case, probably because there is bare bone in the drum-cavity.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OFJ. SOLIS-COHEN, M.D.,
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PRIMARY SARCOMA OF THE TONSIL.

An instance is reported by DR. HOLGER MYGIND, of Copenhagen (*Journ. of Lar. and Rhin.*, August, 1890), in which treatment by electrolysis at the periphery failed to arrest the progress of the disease, which terminated fatally.

NASOPHARYNGEAL TUMORS.

M. HIGGUET has reported (*Journ. de Méd. de Chir. et de Pharm.*, 5 Juin, 1890) a curious case of spontaneous detachment and expectoration of a fibromyxoma, the size of a large nut, from a boy fourteen years of age, from whom the day previous a mucous polyp had been removed anteriorly with the cold snare. Its pedicle had had the same point of attachment as the tumor removed from the nose.

M. CAPART (*Idem*) had succeeded in considerably reducing by electrolysis a fibroid polyp in a boy fifteen years of age. It was attached to the base of the cranium, behind the right nasal fossa. An attempt to remove it in mass had produced such extensive hemorrhage as to preclude continuance of the manipulation. Eight sittings had been had, of twenty minutes each, with a current of fifteen to twenty milliamperes, at first with both needles in the tumor, but more recently with but one.

MUCOUS POLYP OF THE ANTRUM.

M. RUTTEN reports (*Journ. de Méd. de Chir. et de Pharm.*, 5 Juin, 1890) a case of empyema of the antrum, in a man fifty-four years of age, in which the nasal suppuration underwent augmentation after extraction of the second molar tooth. Soon afterward a polyp was seen descending several millimetres below the alveolus. It was removed with the cold snare, and the parts were cauterized with chromic acid. The alveolus cicatrized completely, and the cure was complete.

TUBERCULOUS NASAL GROWTHS.

M. HIGGUET has reported (*Journ. de Méd. de Chir. et de Pharm.*, 5 Juin, 1890) two instances in females of bilateral tumors of the septum cured by curetting. M. Capart mentioned that he had operated upon eight cases, and stated that in the absence of microscopic examination they were readily confounded with sarcoma.

NASAL REFLEXES.

DE. O. LAURENT has reported (*Journ. de Méd. de Chir. et de Pharm.*, 5 Juin, 1890) an instance of highly increased oppression following cauterization of hypertrophic middle turbinate bodies, and which was insusceptible of relief as the cicatrices could not be excised. It was believed that the cicatrices had enveloped certain extremities of filaments of the fifth pair of nerves, and, in retracting, provoked irritation and inflammation. He recalled that Rethi had related five cases in which similar cauterizations had provoked sternutation, vertigo, supraorbital neuralgia, and laryngospasm; three of which were relieved by subsequent ablation of the cicatrices, while the other two remained unrelieved.

ON THE RELATIONS OF THE LARYNX TO THE MOTOR NERVOUS SYSTEM.

DR. FELIX SEMON and MR. VICTOR HORSLEY, of London, present (*The Medical Press and Circular*, August 13, 1890) a general revision of the result of their observations, clinical and experimental, which began with Semon's recognition that the abductor muscles of the vocal bands always suffered primarily, or even exclusively, in progressive organic lesions of the motor laryngeal nerves, from the bulb downward to the periphery, while the antagonistic group of adductors almost always suffered alone in functional disorders. Since Semon's first publication in 1881, he has from time to time recorded subsequent confirmative observations. Some months before the appearance of Semon's first article, Rosenbach had expressed a similar opinion in regard to a special vulnerability of the abductor laryngeal muscles, as contrasted with their antagonists.

Semon and Horsley believe that the bulb contains a centre for respiratory movements of the larynx independently of those of the thorax, and for two reasons:

1. Because of the existence of a reflex abductor tonus which keeps the glottis wide open while the thorax is continuing its rhythmic movements; and

2. Because direct experimental observation in the cat shows that excitation of the upper portion of the floor of the fourth ventricle evokes persistent abduction of the vocal bands, even while the thorax continues its rhythmic expansion and contraction.

They also recognize a phonal centre in the bulb, excitation of which produced immediate closure of the glottis. Excitation of the ala cinerea, and of the upper border of the calamus scriptorius invariably produces bilateral movements of closure. Excitation of the restiform body, and of its inner border in a vertical line, produces adduction of the vocal band of the same side. They have been unable to decide whether this unilateral effect is attributable to excitation of a small centre, or of the efferent fibres running to the vagal roots.

The specific action of systemic anæsthetization, notably etherization, produces considerable variation in the results; large quantities of ether limiting the movements to abductions, and moderate narcotization permitting the differential representations described. The different effects on the peripheral

muscles are presumptively ascribed to differences in their biological constitution, including the nerve-endings.

Special laryngeal representation has been found in the cortex; there being certain differences between animals of different species and between young and adult specimens of the same species. Of all the species used, the cat presented the greatest development of respiratory representation, and the monkey the least; an actual centre for genuine abduction having been found in the cat only, and existing just above the olfactory or rhinal sulcus. Phona-tory representation was found to exist bilaterally; adduction being intensest in the anterior half of the foot of the ascending frontal convolution, and diminishing toward the peripheral portion of the area; excitation of the extreme margin resulting only in producing the cadaveric position of the vocal bands. Bilateral movements follow unilateral excitation, even when the opposite area has been extirpated, and even after division of both crura cerebri, after ablation of both hemispheres, and, indeed, after removal of the cerebellum as well.

THE PHONATORY ACTION OF THE POSTERIOR CRICO-ARYTENOID MUSCLE.

DR. PAUL RAUGÉ (sur la Physiologie normale et pathologique des Muscles du Larynx, *Lyon Médical*, Août 3, 10, 1890) contends for the physiological duty of the posterior crico-arytenoid muscle as primarily a fixator of the arytenoid cartilage for purposes of phonation, and as only secondarily a dilator of the glottis in fixed inspiration. He follows the lead of Jelenffy, of Buda-Pesth, in contradistinction to the vast majority of anatomists, physiologists, and laryngologists, who adhere to the old opinion that this muscle is the respiratory or dilator muscle of the larynx. Raugé's views are based upon anatomical grounds, including the architectural structure of the arytenoid cartilage, and the methods of attachment of its muscular investiture. He is therefore inclined to regard the majority of instances reported to be paralysis of the abductors as in reality examples of contracture of the constricting muscles.

OBSTETRICS.

UNDER THE CHARGE OF

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THE OPERATIVE TREATMENT OF PREGNANCY COMPLICATED BY CANCER OF THE UTERUS.

SUTUGIN (*Zeitschrift für Geburtshülfe*, Band xix. Heft 1) reports two cases of pregnancy complicated by carcinoma of the cervix treated by amputation

of the uterus. In both cases the life of the child was saved. In one case the mother perished from exhaustion forty-two days after the operation; in the other the patient died eight days after operation from peritonitis caused by infection from the cancer. The operation was performed in both instances when labor was well advanced. The stump of the uterus was secured by an elastic ligature at the lower angle of the abdominal wound, and was dusted with plaster-of-Paris and iodoform.

If cancer is advanced, it is agreed that the Cæsarean operation should be performed. If cancer is discovered early in pregnancy, the extirpation of the uterus is indicated. In such cases as those reported by Sutugin, where cancer is limited to the cervix only, uterine amputation will save the life of the child, and does not complicate the existence of the mother.

CHOREA DURING PREGNANCY.

PANTZER (*Centralblatt für Gynäkologie*, No. 32, 1890) reports the case of a woman, aged twenty-six, pregnant for the fifth time, and suffering from severe chorea. Her movements had been so excessive that labor was induced, after which choreic movements persisted for several weeks. During the present pregnancy chorea became so pronounced as to oblige her to enter a hospital. She was easily controlled by morphine, although the movements could be readily excited. The examination of the patient disclosed no evidence of disease threatening the interests of her child or herself at confinement. The treatment employed was that usually given, with the added precaution to avoid large doses of bromides, which tend to favor hæmorrhage after labor. The patient recovered well from a normal labor.

CARDIAC DISEASE COMPLICATING PREGNANCY IN LABOR.

MACKNESS (*Edinburgh Medical Journal*, 1890, p. 123) reports a case of pregnancy complicated by aortic and mitral disease, in which labor was induced at term, as birth did not occur at the usual period. Difficulty was experienced in bringing on labor-pains; the action of the heart being extremely weak, the patient was given five minims of tincture of strophanthus every four hours, with a half-ounce of brandy and beef-tea at frequent intervals. It was necessary to complete labor by the forceps. Considerable hæmorrhage followed, which was allowed to go on for some time, and which seemed to relieve the patient. The child was large and well developed. The administration of strophanthus was continued, and after a tedious convalescence, the patient recovered sufficiently to do light domestic service.

The case is interesting from the excessive cardiac disease which was present, from the fact that the patient became excessively weak, and suffered from persistent emesis, and also from the success in treatment. Chloroform was used freely during labor, and with the best results. Nitrite of amyl is frequently of service in these cases.

THE PUBIC SEGMENT OF THE PELVIC FLOOR DURING LABOR.

WEBSTER (*Ibid.*), from a series of dissections in the study of this question, concludes that the pubic segment is not pushed downward during labor, but

elevated by the upward traction of the uterus. This force is exerted from the beginning of labor, but is counterbalanced in the beginning. Long persistence of the bag of membranes also retards elevation. The greater portion of the bladder is not drawn up during labor, but remains behind the pubes. The urethra is not elongated during labor.

CÆSAREAN SECTION.

MURRAY (*New York Medical Journal*, page 673, 1890) reports the case of a multipara, in whom a contracted pelvis (anterior-posterior diameter three and five-eighths inches) delayed labor. Prolapse of the left arm and hand resulting, with tetanus of the uterus, it was determined to perform Cæsarean section, to which the patient assented. The elastic ligature was used to control bleeding, and the usual Säger operation was performed. Recovery ensued, and the child, a healthy male, survived. In contrast to this case, Murray reports one of contracted pelvis, in which, in endeavoring to perform version by Hicks's method, the child become impacted, the head becoming firmly wedged at the brim, necessitating craniotomy. In the second case, Murray would have performed Cæsarean section had the patient been seen before the death of the child.

MAGAN (*Medical Press*, vol. ci. No. 1) performed Cæsarean section upon a patient much below the average size, in whom the head did not show the slightest tendency to engage at the brim of the pelvis. The patient recovered well from the usual operation, the sutures having been inserted in accordance with Fritsch's method, by which each stitch passes through muscle and decidua. The uterus did not contract perfectly, the patient losing considerable blood *per vaginam*. Complete recovery ensued with the discharge of the uterine sutures.

PUERPERAL FEVER.

At a recent meeting of the Obstetrical Society of London, in a discussion regarding fever in childbed, opened by BOXALL, it was concluded that bichloride of mercury remained the best antiseptic known, but that its routine use in douches was not necessary. In several hospitals of London salufer had been tried as an antiseptic, but found inferior to corrosive sublimate.

A CASE OF PLACENTA PRÆVIA COMPLICATED BY A TRANSVERSE SEPTUM IN THE UTERUS.

MCCALL (*North American Practitioner*, No. 8, 1890) reports the case of a multipara in whom placenta prævia with a transverse uterine septum existed. Although embryotomy was performed, the mother perished from hæmorrhage. The septum was of traumatic origin, the patient having fallen, striking her side against a fence-rail, early during her pregnancy.

THE ANATOMY OF TUBAL PREGNANCY.

ABEL (*Centralblatt für Gynäkologie*, No. 37, 1890) concludes from his studies on this subject that the endometrium forms in the beginning a decidua

membrane in which Friedländer's cellular layer is not fully developed. The superficial epithelial layer of the uterine decidua is present at the second month, although in a degenerate form. That portion of the tube external to the foetus generally remains unaltered. In the foetal sac the mucous membrane of the tube forms a decidua vera which is most strongly developed at the extremity of the ovum, at the termination of its greatest diameter, until the serotina is completely atrophied. The superficial layer of the serotina is replaced by the endothelium from the bloodvessels. Beneath this membrane normal epithelium from the mucous membrane of the tube is often found. The epithelium of the villi of the chorion is threefold, two layers over the foetal, and one over the maternal vessels. The spaces between the villi are dilated maternal bloodvessels whose walls are not broken through by the villi of the chorion.

SUICIDE DURING PREGNANCY WITH RUPTURE OF THE UTERUS.

NEUGEBAUER (*Centralblatt für Gynäkologie*, p. 88, 1890) reports the case of a primipara nearly at term who committed suicide by throwing herself from the third story of a house upon the stone pavement. On examination, fracture of the skull and lacerated wounds of the head and face were found. The uterus could be outlined, but no symptom of labor was present. The patient perished in shock, and post-mortem examination revealed rupture of the uterus, the child lying among the intestines covered by the mesentery. It had evidently occupied the position of breech-presentation during the life of the mother. The patient survived for several hours after her fall, during which time no hæmorrhage could be discovered. The membranes remained unruptured, and probably occasioned the failure to diagnose rupture of the uterus. Although the mother sustained fracture of the skull, she twice sprang from the bed, and became partially conscious on one occasion. A detailed account of the injuries to the mother's pelvis accompanies the report of the case.

A CLINICAL STUDY OF PUERPERAL INSANITY.

WORCESTER (*American Journal of Insanity*, volume xlvii. p. 52, 1890), from a clinical study of eight cases of the various types of puerperal insanity, concludes that this disease is not a distinct form of mental trouble. He has not been able to decide, in the absence, of the knowledge that the case was that of a puerperal patient, that any given case was one of puerperal and not one of insanity from some other cause.

A CRANIOCLAST WITH PELVIC CURVE.

PINZANI, in a pamphlet entitled *Un Craniocluste Inclinatore*, Bologna, 1890, describes a modification of Braun's cranioclast which possesses a pelvic curve. In addition to this, one of the branches is shorter than the other, and is so arranged as to articulate with the first in two different sockets, thus enabling compression to be made at a considerable angle by which more perfect crushing of the head must result. The cephalic extremities of the blades have been somewhat altered to meet the changes in the handles.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

SCHÜCKING'S METHOD OF OPERATION FOR RETROFLEXION.

At a discussion of this operation at a recent meeting of the Leipzig Obstetrical Society (*Centralblatt für Gynäkologie*, No. 31, 1890) SCHÜCKING stated that sixty-two cases had been reported, forty-eight being his own. He had found that it was also possible to cure prolapsus by his method, since the uterus was maintained in a position of antelexion—the chief result at which Thure Brandt aims by his manipulations.

Sänger could not understand how prolapsus could be cured by the vaginal ligature, since it could hardly fix the uterus in a position of antelexion, and must, moreover, cause lateral deviation of the organ. Although no serious injuries to the bladder or intestines had yet been observed, he did not see how these could be absolutely avoided. In order to avoid perforation of the bladder he suggested separation of the organ as high as the vesico-uterine fold of peritoneum before passing the suture. He called attention to the fact that Brandt aimed rather at *posterior* fixation of the prolapsed uterus by restoring the tone of the relaxed sacro-uterine ligaments.

Schücking denied that lateral deviation of the uterus was caused by the vaginal ligature.

SECONDARY CANCER OF THE OVARY.

SÄNGER reported at the same meeting the following cases of carcinoma ovarii:

CASE I.—The patient was a stout woman, forty-six years of age, whose uterus had been removed for carcinoma corporis in June, 1888, the right tube and ovary being left *in situ*. She made an easy recovery, and remained in good health until August, 1889, when a solid tumor appeared in the abdomen, which grew rapidly, and was associated with ascites, anasarca, and emaciation. As the condition was supposed to be metastatic deposits in the peritoneum, and the patient was very weak, laparotomy seemed to be inadvisable. During the next few months five gallons of ascitic fluid were withdrawn at different times. After the last aspiration she improved so much that it was decided to make an explorative incision. This was done in February, 1890. The tumor was found to be a slightly adherent carcinoma of the right ovary, weighing twenty pounds, unaccompanied by metastatic deposits. The cicatrix in the vaginal vault was carefully examined, and exhibited no traces of a recurrence of the disease. The patient made a rapid recovery, and was in perfect health four months later. The interesting features in this case were the recurrence of the disease in the remaining ovary (a strong argument in favor of always removing the adnexa with the

cancerous uterus), and the presence of ascites and anasarca without general carcinomatous disease of the peritoneum. The ascites in this instance was probably due to pressure of the movable tumor upon the iliac and azygos veins; as the growth rose into the abdominal cavity this pressure became less, which result was also favored by the removal of the fluid.

CASE II.—A woman, thirty-six years of age, had been operated upon (curetting?) nine months before for diffuse adenoma of the cervix and body of the uterus. Laparotomy was performed for the removal of an abdominal tumor, which proved to be a cysto-carcinoma of the right ovary weighing twelve pounds. As the patient was very stout, it was possible that the tumor existed at the time of the first operation and was overlooked. The case was interesting as indicating a direct relation between the semi-malignant growth of the endometrium and the undoubted carcinomatous tumor of the ovary. [Unfortunately no mention is made of the condition of the tubes in either case. This is a serious omission, since it leaves the reader in doubt as to whether the disease extended to the ovary by continuity, or developed by metastasis, or *de novo*. We have always insisted upon the importance of removing the adnexa in cases of total extirpation for malignant disease of the corporeal endometrium in order to avoid what Sanger has shown is a real, and not a theoretical, danger from recurrence. When the disease is confined to the cervix it is not absolutely necessary to remove the tubes and ovaries, except to avoid certain psychoses which have occasionally been observed when the ovaries remained functionally active after extirpation of the uterus alone.]

CARCINOMA OF THE OVARY WITH RECURRENCE IN THE BREAST.

RONPINEL (*Annal de Gynecologie*, No. 1, 1890) performed laparotomy upon a woman, et. fifty-three, who had been tapped thirteen times for ascites. A cysto-carcinoma of the left ovary, the size of the two fists, was removed and the patient made a smooth recovery. There were no metastases in the peritoneum. Three months later a small nodule appeared in the left breast and grew slowly for seven months, when the breast was amputated. Five months after a second operation was necessary on account of a recurrence in the cicatrix. Six months later the patient again reported, and it was found that not only had the disease returned in the breast, but the ascites had reappeared. After tapping, multiple nodules could be felt over the entire surface of the peritoneum. The patient succumbed from exhaustion after having been tapped three times.

PRIMARY SARCOMA OF THE VAGINA IN YOUNG CHILDREN.

FRICK (*Virchow's Arch.*, Bd. cxvii. 2, p. 248) reports two cases of this rare affliction, only seven of which have been recorded, and all but one have terminated fatally. One child was seven months old, the other two and one-half years; in the former the growth rapidly recurred after removal; in the latter a second operation was performed eight months after the first, since which two years had elapsed without return of the disease. Sarcoma in this region in children is of the mixed variety, and assumes a polypoid

shape. It is purely local, spreading by direct continuity, and terminating fatally in less than a year. The cases reported are the first in which operative interference was attempted. In excising these growths the entire base of the tumor, and as much as possible of the adjacent vaginal wall, should be removed.

OSTEOPLASTIC RESECTION OF THE SACRUM IN OPERATIONS UPON THE FEMALE PELVIC ORGANS.

BERNHARD VON BECK (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) reports seven cases in which Hegar performed this operation in order to render accessible disease of the internal pelvic organs. In four instances the condition was cancer of the uterus, in one pelvic abscess, in one double pyosalpinx, and in one old perimetritis. The latter case was of considerable interest, as it was one of persistent pain after removal of the adnexa. A hard, sensitive nodule was felt in Douglas's pouch, which seemed to be the point from which radiated the neuralgic pains. It was excised from below after preliminary resection of the sacrum, and the patient was permanently relieved. Hegar has modified Herzfeld's original operation, and does not remove any of the bone. After dissecting away the rectum from its anterior surface, a chain saw is introduced between the third and fourth foramina, the sacrum is sawn through at right angles to its long axis, until the periosteum on its posterior surface is reached; the lower fragment is then turned upward and backward, and after the operation is restored to its place, and the external wound is closed over it. The advantages claimed for this method of extirpating the uterus are as follows: The field of operation is clearer than in the vaginal method, hæmorrhage is at once observed and is more readily controlled, and there is less danger of wounding the bladder and ureters; the entire uterus may be removed without opening the peritoneal cavity, thus reducing the chances of septic infection to a minimum.

ASEPTIC LAPAROTOMY.

FRITSCH (*Centralblatt für Gynäkologie*, No. 29, 1890) has rejected all chemical antiseptics in abdominal surgery, except for cleansing the patient's skin and the hands of the operator and assistants. Towels, sponges, and instruments are sterilized by steaming, and boiled water is used throughout the operation for all purposes. "From the beginning until the application of the bandage no chemical disinfectant touches the wound." A table is appended showing the results of fifty-two laparotomies performed according to this method in the course of five months (including one Porro, one Cæsarean section, and nine laparo-myomotomies), with a single death from persistent ether-vomiting.

ELECTRO-THERAPY IN GYNECOLOGY.

NAGEL (*Archiv für Gynäkologie*, Bd. xxxviii. Heft 1) after a careful trial of Apo-toli's method during a year, arrives at the following conclusions regarding the electrical treatment of uterine fibro-myomata. The treatment is to be regarded as purely symptomatic. The constant current

in these cases relieves pain, especially when this is due to former peritonitis; in order to accomplish this result it is not always necessary to introduce one electrode into the uterus. As the peritonitis is improved the tumor becomes more movable, and the tension of the abdominal walls is diminished. Hæmorrhage is often lessened by the constant current, especially if the entire endometrium is accessible to treatment. Through the relief of pain and the checking of the hæmorrhage, as well as by the favorable influence of the agent upon the intestines, the general condition of the patient is much improved. Although the writer has not observed any diminution in the size of the tumor, he believes that it may occur up to a certain degree.

The general impression which he derived from studying the effects of the electrical treatment in pelvic disease was that in some cases a cure might be effected, but that the results obtained did not surpass those which followed other methods of treatment, when the latter were carried out as carefully and persistently as the former.

VAGINAL HYSTERECTOMY FOR CANCER.

FLAISCHLER (*Deutsche med. Wochenschrift*, No. 29, 1890) reports twenty cases of total extirpation operated upon in the past five years, with three deaths from sepsis. Seven patients had since died from the disease, and eleven had no recurrence, of whom six had been operated upon at least three years before. He insists upon greater care in the selection of cases, not so much because of the immediate as of the remote results of the operation. Only those are suitable for the radical operation in which there is strong probability that the cure will be permanent. It is not justifiable to remove every uterus which can be easily drawn downward when there is suspicious induration in the broad ligaments. Sometimes it is impossible to determine positively, even under ether, whether the perimetrial tissues are involved or not, or to decide between malignant and simple inflammatory indurations in the broad ligaments. Under these circumstances it is better to give the patient the benefit of the doubt.

According to Volkmann, a patient can only be regarded as cured when three years have elapsed after the operation without recurrence, while Fritsch places the limit at six years. Tanner believes that while a patient may be said to be cured, it is only a question of a few or many years before the disease returns. Fleischler regards the latter view as too pessimistic, although sufficient evidence has not yet been accumulated to decide positively against it. He thinks that total extirpation is no more dangerous than high amputation(!); the latter operation should be regarded as a transitional step in the development of the former, and is not to be compared with it.

RECENT MODIFICATIONS IN THE TECHNIQUE OF LAPARO-MYOMOTOMY.

KELLY (*Medical News*, vol. xlv., No. 52, 1890) describes the following modification of Hegar's and Schröder's methods: A long incision is made, the tumor is elevated, and the pedicle constricted with a rubber cord; the growth is removed one or two inches above the cord by splitting the peritoneum and excising a wedge-shaped piece from the stump. The cervical canal is dis-

sected out and thoroughly cauterized. The raw face of the stump is closed by a continuous buried suture of catgut, its peritoneal edges being united by interrupted silk sutures, the long ends of which are left uncut. The rubber ligature is now removed, and if there is much oozing it may be necessary to ligate one or both uterine arteries, which is readily accomplished by passing a stout, curved needle, armed with catgut, through the side of the stump, the latter being drawn over to the opposite side by means of the long ligatures. The parietal peritoneum is united to the peritoneal covering of the stump, below the line of the raw surface, by a continuous catgut suture. The wound is dressed in the ordinary way with aseptic gauze, and the long ligatures are brought out through the opening which is left at its lower angle and through the dressing, and are secured by a pair of long Keith's forceps. The stump is thus kept from slipping back into the abdomen, and is readily accessible in case of hæmorrhage. The silk sutures come away, or may be removed, in ten days and the opening in the abdominal wall rapidly fills up by granulation. The advantages claimed for this method over the intra-peritoneal are the less risks from hæmorrhage and sepsis; over the extra-peritoneal are the absence of the sloughing which necessarily takes place when the rubber ligature is employed, and the diminished traction on the stump, because the operator is not obliged to raise it up high enough to suture the peritoneum to it below the ligature.

FEHLING (*Centralblatt für Gynäkologie*, No. 29, 1890) finds that the sinus left after separation of the stump heals more quickly if its edges are freshened by scraping (after thorough disinfection), and are brought together by deep and superficial silver sutures, which include all the layers down to the peritoneum. A small drain is left at the site of the cervical canal. He has lost only three out of thirty cases of myomotomy in which the pedicle was treated by the extra-peritoneal method.

TREUB (*Journal de Médecine de Paris*, No. 30, 1890) reports forty-two cases of hystero-myomectomy with four deaths, only one of which was due to sepsis. His method is as follows: After lifting the tumor through an abdominal incision of ample length, the ovarian arteries and tubes are ligated on both sides, then the pedicle is constricted with a permanent elastic ligature (consisting of a Charrière's *sonde filière* that has been kept in strong carbolic solution), which is cut short; the uterus and tumor are removed, and the cervical canal is disinfected with a solution of bichloride, 1 : 500. The stumps of the uterus and broad ligaments are sprinkled with iodoform and all are dropped back into the pelvic cavity, care being taken that the latter is free from coils of small intestine which might readily be imprisoned between the uterine stump and the brim of the pelvis. The writer says that by this method the most complicated operation can be completed in three-quarters of an hour. In all his cases the patient was able to leave her bed on the fourteenth day, and was discharged at the end of three weeks.

LEOPOLD (*Archiv für Gynäkologie*, Band xxxviii. Heft 1) believes that myomotomy is indicated when the tumor is larger than a child's head, is growing rapidly, and affects the general health by reason of the pain, hæmorrhage, and pressure-symptoms to which it gives rise. If the tumor is subserous, and fairly pedunculated, he incises the capsule, shells it out, and

closes the peritoneal wound without opening the uterine cavity. If only a small opening into the uterine cavity is made, the branches of the uterine arteries should be ligated on both sides and the surface of the stump should be closed with deep and superficial sutures, after which it is dropped back. When a considerable portion of the uterus would be removed with the tumor, it is better to excise the entire mass and to treat the stump according to the extra-peritoneal method. The writer prefers vaginal extirpation of the myomatous uterus when the tumor is not larger than a child's head, but gives rise to severe hemorrhage and pressure-symptoms, when one or both ovaries are diseased, and are so firmly adherent that they cannot be removed, and when the patient is too weak to stand laparotomy. The steps of the operation are as follows: After thorough disinfection of the parts, the rectum is stuffed with iodoform-gauze. If the vagina is too narrow, more space is gained by incising it laterally. The vaginal attachment to the cervix is then divided, and the bladder is separated from the cervix; Douglas's pouch is opened, and a sponge is introduced to prevent prolapse of the gut. The uterus is drawn down with a volsella, and the broad ligaments are ligated and divided. If the uterus is so large that it cannot be drawn down, and the tumor is accessible through the posterior incision, its capsule may now be opened, and it may be shelled out with the finger. After the uterus has been removed the peritoneal edges of the wound are sutured in the middle, openings being left at each side where the stumps are placed, and the vagina is tamponed with iodoform-gauze. The writer has performed fifty-six laparomyotomies with twelve deaths, and twenty-one vaginal extirpations for myoma with three deaths.

KOCHER (*Correspondenzblatt für Schweizer Aerzte*, No. 26, 1890) first ties off each broad ligament in two portions, the upper ligature including the ovarian, and the lower the uterine artery. A stout ligature, composed of numerous pieces of fine silk twisted together, is then made to encircle the uterus at the level of the uterine artery and this is drawn as tight as possible and is tied. The peritoneal covering of the stump is first incised and the tumor is then drawn upward so that the muscular tissue will be divided at a lower level. The cervical canal is disinfected with sublimate solution, and is thoroughly cauterized with the Paquelin. The raw surface of the wedge-shaped stump is then closed with deep and superficial continuous sutures of silk, the lateral being applied in the same manner as in the modified Cæsarean section, so as to roll in the peritoneal edges, and to bring the serous surfaces in contact. The stumps of the broad ligaments are covered with peritoneum in the same manner. The stump is dropped back, and the abdominal wound is treated in the usual way.

THE TREATMENT OF RECENT GONORRHOEA WITH THE CONSTANT CURRENT.

PROCHOWNICK (*Münchener med. Wochenschrift*, No. 27, 1890) was led to test the antimycotic action of the positive pole of the galvanic current in cases of gonorrhœa in women. Assuming that the cervical canal is the chief seat of infection, whence it extends along the endometrium to the tubes, it is important that it should be arrested at this point. To this end the positive

pole was introduced into the uterus and a current not exceeding 120 milliamperes was used for not longer than ten minutes. The cervical discharge was examined microscopically before and after the treatment, the presence of gonococci being demonstrated in each of the four reported cases. In every instance after four *séances* the microorganisms disappeared, and after six or seven the discharge instead of being a thick, greenish-yellow one, became thin and watery.

The writer states that this method of treatment cannot be applied to specific urethritis in the female, because the urethra is so sensitive that a current with an intensity above 40 milliamperes would not be tolerated, and any strength below 100 milliamperes would be powerless to destroy the cocci.

HYALINE-FIBROID OVARIAN DISEASE.

GIBBES (*Boston Medical and Surgical Journal*, August 7, 1890) supplements a former paper on the "Origin of Ovarian Cysts" by a statement of the results of his further microscopical studies of hyaline degeneration of the ovarian stroma, which he now believes to be quite common. He has come to the conclusion that it is not a true degeneration, but is a new formation of fibrous tissue. The initial process in this change is the appearance of small wavy processes of fibrous tissue in the midst of the stroma. These increase in size and number, still preserving their tortuous arrangement, while between, and closely united to, them appear branched connective-tissue corpuscles. This change is not peculiar to the ovary, but is found also in pulmonary tubercle and in carcinoma and sarcoma of slow growth—in short, under conditions of chronic irritation. In all these formations the new growth is of such low vitality that its central portion tends to break down and form a cavity, which cavity in the ovary may become filled with fluid, undergo gradual dilatation, and form a large cyst. Clinically, the relation between chronic irritation and ovarian disease is evident. "This irritation is probably of nervous origin, and is brought about by an abnormal condition of the patient and her surroundings." If taken at an early stage, the writer believes the affection to be easily curable.

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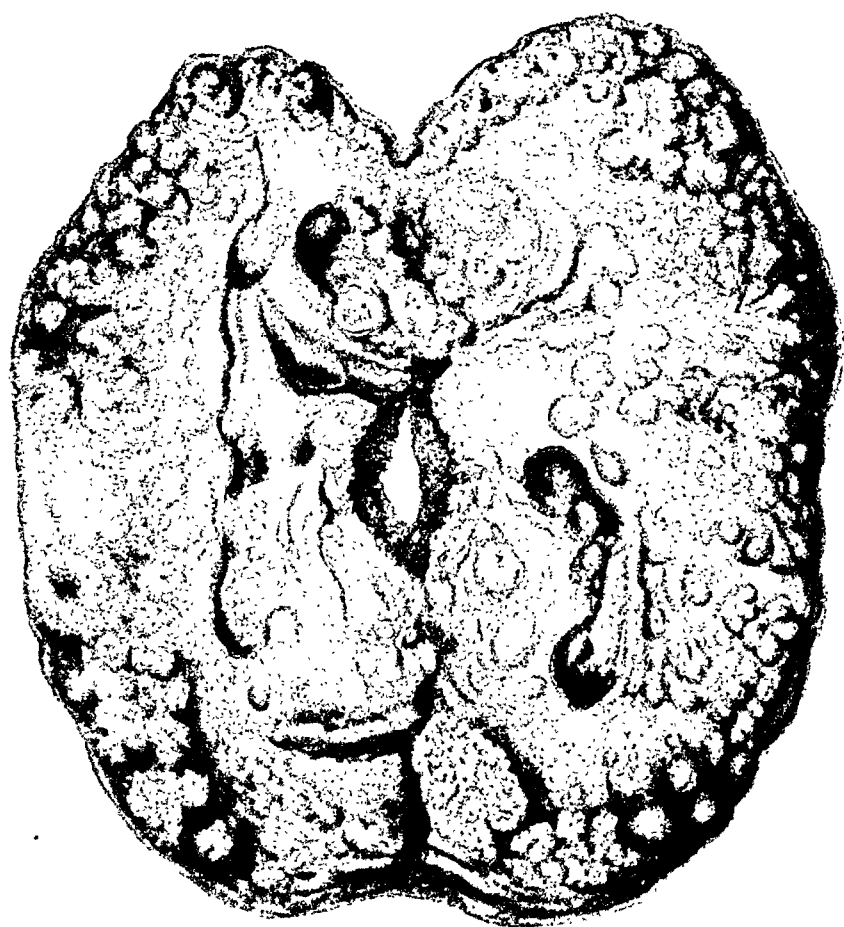
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ADENOMA OF THE KIDNEY.

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ADENOMA OF THE KIDNEY—SUCCESSFUL NEPHRECTOMY.

BY E. L. KEYES, M.D.,
OF NEW YORK.

CASES of nephrectomy, successful or otherwise, have long since ceased to excite general interest unless their merit lies in some feature outside of the simple operative act and its success or failure. Such merit, in my opinion, is offered by the case I present for consideration, in this, that it furnished clinically the features of cancer, that the gross appearance of the organ when removed justified the worst prognosis, that two excellent pathologists pronounced its microscopic structure to be that of cancer, but that nevertheless the neoplasm turned out to be adenomatous, and the patient to-day, more than a year from the operation, is alive and well.

Such records are surely encouraging for the general operator and should be put in evidence. Moreover, the history of renal adenoma and its literature, so far as I know, have not been very systematically worked out, and this case is reported with the aim of attempting to fill the gap.

The description of the pathological specimen, the drawings and the microscopic description, together with the history of adenoma and the bibliography, have been worked up seemingly with great care by Prof. Hermann M. Biggs, of the Carnegie Laboratory, to whom I am much indebted for the preparation of that portion of my paper, and whose words I have directly incorporated. The clinical record need only be brief:

A gentleman of forty-nine, pale and feeble, called upon me May 19, 1889, stating that he had been failing for more than a year, and for many weeks had passed urine resembling pure blood. He had been treated for alleged stomach trouble of some sort, and dieted, rested, and given astringents *ad nauseam*. Rest did not moderate the flow; on the contrary, it was commonly worse at night than by day, a peculiarity not unusual in hæmorrhage from the kidney, as Guyon has pointed out.

The urine passed in my presence and brought to me resembled dissolved currant-jelly, or perhaps grape-jelly, and all that the patient passed was of this hue; he was blanched and feeble and manifestly in a fair way to lose his life by collapse from loss of the nutritive juices unless something were done to put an end to the leak.

I found that the amount of urea excreted in twenty-four hours was ample; I easily excluded the bladder from disease by the well-known test of first collecting a portion of the urine passed in my office, then washing the bladder until the flow came away perfectly clear, then

getting the patient to wait for a time and finally to pass another specimen, and finding that the last absolutely resembled what first flowed in the office, there being no bright blood in either specimen, and each being equally dense. Then under chloroform I clearly mapped out a moderate enlargement of the right kidney, and placed the alternative before the family of the patient of trying the milk-and-rest cure with certain styptics, or taking the bolder course of extirpating the kidney, hoping that the disease might not be malignant, but being unwilling to assert that it was not so. The latter alternative was chosen by the family, and, therefore, on May 28, 1889, with one transverse incision beneath the ribs and another liberating incision downward, I extirpated the kidney without any particular trouble.

The only elements of special interest in an operative sense were the plain demonstration of the upward and downward movement of the kidney as the diaphragm relaxed and contracted, which was shown very clearly by a livid mass in the fatty capsule of the kidney, which could be seen to fluctuate over a space of at least two inches under the movements of the diaphragm, the dark body being watched as it went upward and downward beneath the fascia transversalis before the abdominal cavity had been finally opened.

Another point was that the fatty capsule was exceedingly thin and particularly hard, so that the true capsule of the kidney adhered to the surrounding structures and had to be separated with great care and some dissection. Indeed, I feared that I must necessarily open the peritoneal cavity, so strong were the adhesions anteriorly to the lower part of the kidney. The kidney itself felt like rock; it was not very large, but was excessively hard and mottled in color, being somewhat uneven upon its surface. Silk ligatures were used, the wound dressed as usual, and no particular disturbance occurred during the patient's recovery, except that first one and then the other leg became cedematous, the swelling being very considerable and very tense.

The cause of this was not clear to me then, and is not now. I presumed that it might be due to pressure from retro-peritoneal glands, although at the time of the operation I had not felt any; but as the swelling first came upon the left limb, the right kidney having been removed, I failed to understand it. There certainly was no pyæmia, there certainly was no phlebitis; both legs became cedematous and so remained for many months. Recently this cedema has disappeared. I noticed precisely the same thing occur in another instance in which I removed a large stone from the kidney. The opposite thigh and leg became cedematous as the patient was recovering, the cedema finally disappearing. I have not encountered this feature in abdominal nephrectomies.

My patient was up and out at the end of a month, he remained feeble and anæmic for a considerable period, and then began to grow fat. He is now perfectly well physically, his urine is abundant in quantity and absolutely clear. His functions are all properly performed, and the only particular in which he feels at all less well than before his kidney was removed is in that his nerves are less steady than they were before the operation; he attends to his business and is in all physical respects reasonably, if not perfectly well.

The kidney, of which the accompanying plate is a fair counterfeit, its hardness, its adhesions, made me feel that a bad prognosis—as to ultimate recovery—was prudent, and this I gave the family. My fears were substantiated by receiving a report from a pathologist who gave me the name of another who had examined the sections—both pronouncing it cancer.

But my patient did not die, and there was no evidence of recurrent disease. The wound healed perfectly, and I therefore besought Dr. Biggs to take the kidney again (he had at first received it, but going to Europe he had not made the first report) and to give me some explanation of the apparent irregularity in the facts. I append his report:

DESCRIPTION OF THE DISEASED KIDNEY.

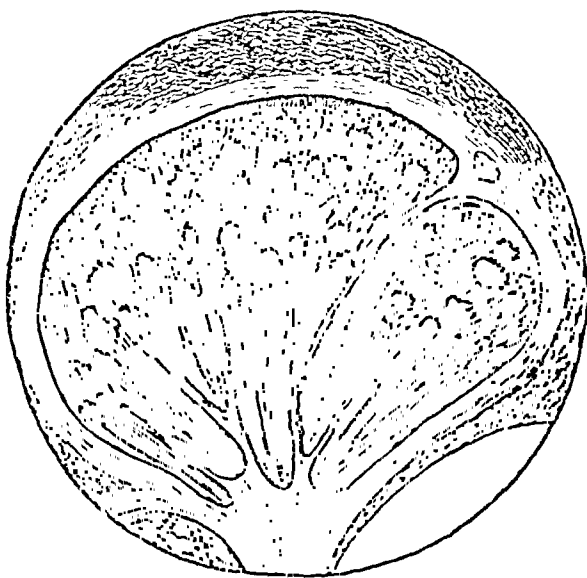
“The organ in the fresh condition was considerably larger than the normal kidney. Its thickness especially was increased and measured

FIG. 1.



Section of the cortex of the kidney showing spaces where numerous adenomata have fallen out of their capsules. Renal tissue almost completely destroyed. $\times 4$. A. Compressed and atrophic renal tissue.

FIG. 2.

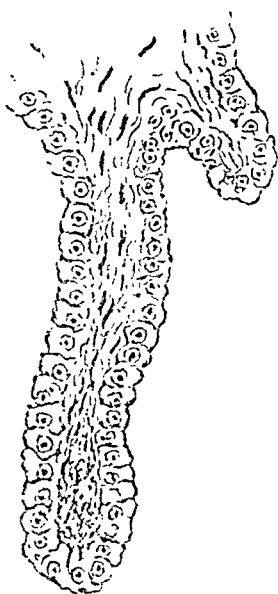


Small adenoma with fibrous capsule and radiating bands of connective tissue forming small, irregular, elongated spaces, which are lined with cells. $\times 20$.

nearly two inches. Its weight in the fresh condition was not determined. The capsule was greatly thickened and was firmly adherent. The surface through the capsule was distinctly nodular. On section the

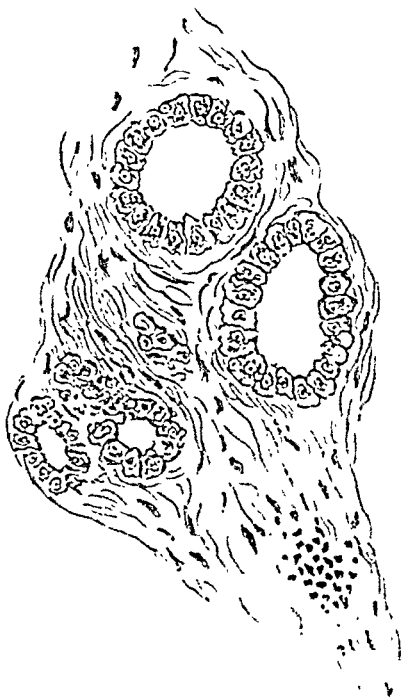
cut surface presented a remarkable appearance. Almost all traces of the normal renal tissue were destroyed and the outlines between pyramidal and cortical tissue were completely obliterated. (Fig. 1.) The organ seemed to be composed of an enormous number of nodules, varying in size from 2 or 3 mm. to 1½ cm. in diameter, and in color from a white or yellow to a terra-cotta or bright red. There were a few small cysts with dark colloid contents. Between and around the nodules was a large amount of new-formed connective tissue. At some points this formed quite large masses of dense, hard fibrous tissue. The consistence of the different nodules varied greatly. In some it was scarcely greater than that found in encephaloid carcinoma, while in others it was nearly as great as that shown in fibromata. There was scarcely any trace of normal renal tissue between the growths. The connective tissue around many of the nodules formed distinct capsules for them, and this was

FIG. 3.



Long unbranched tuft formed by a reduplication of the wall of a cyst, into the cavity of which it projects.

FIG. 4.



Alveolar portion with large amount of connective tissue (atrophic).

especially noticeable around those having a yellow color. The neoplastic tissue had also extended at several points into the calices and pelvis of the kidney. The consistence of this tissue was very slight. (Fig. 2.)

"Microscopical examination of the tissue extending into the pelvis, and of the softer nodules, disclosed a complex structure similar to that found in renal adenomata of both the alveolar and papillary type.

Most of the tissue was composed of branching trabeculae of connective tissue covered by short cylindrical or cubical granular epithelium, closely resembling in appearance the normal renal epithelium. The tufts thus formed were densely packed together, so that it was difficult to make out the structure. (Fig. 3.) The remaining tissue was composed of distinct alveolar spaces lined by epithelium of a type similar to that covering the tufts. The amount of connective tissue in different portions varied greatly. At some points the bands were thick, dense, and numerous, at others very thin and delicate. Occasionally were seen quite long unbranched tufts projecting into open spaces, which spaces were lined by epithelium. (Fig. 4.)

"It was found that the color and consistence of the older nodules depended upon the kind and degree of degeneration that had taken place in them and upon their vascularity. The various types of degeneration shown in adenomata, viz., fatty, fibrous, and pigmentary, were found in different nodules. The fibrous masses seemed to be in part at least the result of the increase of the fibrous tissue and the degeneration and absorption of the epithelium of certain nodules. At some points the epithelium had undergone an extensive fatty degeneration, thus giving to some of the nodules their yellow color. Only the neoplastic tissue in the pelvis of the kidney, and some of the smaller growths, showed the characteristic structure of renal adenoma; in the other portions the original structure was completely obscured by the extensive degenerative changes. The kidney tissue itself seemed to be almost entirely replaced by the new growths, although the general form of the organ was retained.

"Although there were points in different growths where a characteristic alveolar structure was shown, yet the papillary formation appeared largely to predominate. Many of the alveoli present, however, seemed to have been formed as alveoli, and not produced by compression and the transformation of opposed papillary processes into alveoli, as has been suggested by Weichselbaum and Greenish is often the case. As the structure of both forms of adenoma were here shown in the same growths, it would seem as if the separation of adenomata into papillary and alveolar forms was only an arbitrary distinction."

GENERAL CONSIDERATION OF ADENOMA OF THE KIDNEY.

The literature of renal adenoma is rather scanty and mostly of recent date. Tumors known as adenomata were long ago described as occurring in the kidney, but they were supposed to be of extremely rare occurrence. Formerly, they were generally confounded with other growths, and their supposed rarity was probably due to this confusion as to their nature, and to their usually small size and benign character. Recent investigations, however, have shown that adenomata are of comparatively common occurrence in advanced life, although only in very exceptional instances do they reach any considerable size.

In a report to the Scientific Grants Committee of the British Medical Association, made in 1887, on New-growths of Kidney and Bladder, T. F. Paul, F.R.C.S., says: "Adenoma of the kidney is scarcely recognized as a variety of new-growth; and, although we have only three cases, from my own collection, to bring forward, we do not regard it as extremely rare, since, owing to the small size and inoffensive character of the growths, they are liable to be passed over without notice."

Weichselbaum and Greenish, in a very exhaustive paper on this subject, published in 1883, in the *Medicinische Jahrbücher*, report that as far as their observations go, "adenoma never occurs under thirty years of age. After this period it gradually increases in frequency until, after the age of eighty years, it is found in nearly ten per cent. of the cases." The small growths, however, in which form the adenoma usually appears, are (unless a microscopical examination is made) usually mistaken for tubercles or small fibroid tumors which are frequently found in the kidney.

Sturm, in a careful article on this subject, published in 1875, in the *Archiv. für Heilkunde*, thus describes adenoma:

"Adenoma is of comparatively not infrequent occurrence; but up to this time has been described under different names. It develops mostly as a solitary tumor in the lower third at the greatest convexity of one of the kidneys. It always originates in the cortex, beginning by a dilatation of one or more of the convoluted tubules, the epithelium of which undergoes proliferation and causes a gemmation of epithelial cones. These cones are at first hollow, but later, in consequence of secondary changes within the tumor, they appear as solid cones. Adenoma of the kidney and beginning adeno-carcinoma are identical terms. This adeno-carcinoma of the kidney is in every respect analogous to epithelioma of the skin, the mucous membranes, and the mucous glands. The development of adenoma certainly stands in some relation (yet to be determined) to the interstitial connective tissue of the kidney. At least solitary adenoma formation always appears in non-inflammatory, so-called granular kidneys: if adenoma occurs in inflammatory contracted kidneys it is, as it would seem, mostly multiple. These multiple adenomata, which commonly appear at once in both kidneys, have exactly the same structure as the solitary ones. Some of them may develop into genuine carcinomata; most of them, however, degenerate and either appear in the form of peculiar yellow infarctions or as kidney cysts of the most various consistence. Whether these multiple adenomata, which are partially to be looked upon as simply a hypertrophy of the urinary tubules, are actually identical with the solitary form, or whether they stand in somewhat the same relation with the latter as a wart of the skin to epithelioma, I will not undertake to say. At any rate, even after prolonged existence, they almost always produce the impression of a benign neoplasm. The simultaneous appearance of these early degenerating adenomata and inflammatory contraction of the kidney seems to be quite constant, and has been described by old authors as: *Nephritis simplex*."

Synonymes of renal adenoma are: "Lymphangioma (Herschl). Kidney cysts with colloid or melicerous contents (Förster, Virchow, Beckmann, Erichsen)."

Cornil and Ranvier state that: "Adenomata have been accidentally noticed in interstitial nephritis. They have been described by Sturm and Labourin ("Contributions a l'Etude de la Cirrhose Renale," *Arch. de Phys.*, January, 1882). According to Labourin, there are two kinds of tumors: 1st. Tumors of cylindrical epithelium of the renal type, and which are directly derived from the tubules in Bright's granulations. 2d. Tumors of cubical epithelium, which are derived from tubular epithelium which is atrophied or indifferent. From the histological point of view adenomata of the kidney are metatypical epitheliomata; from the clinical point of view they are benignant tumors."

As a rule, adenomata do not exceed a small pea in size, and are frequently much smaller; but in rare instances they reach the size of a large walnut. In about seventy-five per cent. of the cases they are single, but there may be two or more and they may be found in both kidneys. In very exceptional cases one kidney contains a large number of the tumors, of considerable size; and the organ may be almost destroyed. The case here reported is one of this kind.

Adenomata affect the right and left kidney with equal frequency, and apparently they always originate in the cortical portion, and only secondarily involve the pyramids. They appear in the kidney as well-defined yellowish nodules, varying in size from that of a millet-seed to that of a small hen's egg. The smaller ones usually do not have a capsule, but the larger ones may be surrounded by a distinct connective-tissue capsule, formed by atrophy and condensation of the kidney tissue.

The consistence of adenomata varies greatly, depending largely upon the age of the growth and the presence and character of degenerative changes in it. Excepting in those cases in which the tumor has undergone the so-called fibrous degeneration, its consistence is always less than that of the normal kidney-substance, and in some cases the growth may be transformed into a semi-fluid colloid matter, the capsule of the tumor forming the capsule of the colloid cyst. Tumors that have undergone the fibrous degeneration may attain a consistence nearly equal to that of a fibroma. The vascularity of adenomata also varies considerably. The smaller single growths are commonly rather poorly supplied with bloodvessels, but in the larger multiple tumors occasionally the new-formed vessels are so numerous and so large that many hæmorrhages occur in the tumor, and microscopical sections have an appearance not unlike that of cavernous angiomas.

Owing to the fact that these growths always develop in the cortex of the kidney and are usually subcapsular, Grawitz and Israel (*Virchow's Archiv*, 1883) have expressed the opinion that they are due to the development of portions of the suprarenal capsule which have remained adherent to the surface of the kidney during intra-uterine life. There

can be no doubt that such particles of the suprarenal capsule are found on the surface of the kidney. I have often seen them pointed out by Grawitz in his demonstrations in Greifswald, and have since then not infrequently seen them in autopsies in New York. That adenomata are derived from these, however, does not seem to me proven.

Two forms of adenomata are met with in the kidneys: the papillary and the alveolar adenoma. They are apparently the same in nature. Macroscopically, they are not to be distinguished from each other; and microscopically, the larger tumors may show in different parts of the same growths the histological characteristics of both forms.

THE PAPILLARY ADENOMA.

This form consists of a framework of connective tissue, forming spaces of different sizes. From the walls of these spaces, at one or several points, spring papillary tufts, clothed with a single layer of cubical or cylindrical epithelium. These tufts more or less completely fill the spaces. The connective-tissue framework is sometimes rich, sometimes poor, in round and spindle cells, and carries a system of bloodvessels. The lumen of these vessels may be narrow or greatly dilated, forming cavernous spaces. The epithelial cells covering the tufts often undergo fatty degeneration. This degeneration may be so complete that the nodule assumes the appearance of a lipoma.

The tufts when very numerous may be so much compressed and altered in form as to make their recognition difficult. Between the spaces more or less completely degenerated, renal tissue is sometimes found. Thus colloid cysts are formed from compression and transformation of the renal epithelium. The Malpighian bodies generally become fibrous and are frequently found in the fibrous masses remaining after complete degeneration of the renal and adenomatous epithelium.

These growths are apparently produced from the urinary canals, by a dilatation of the tubules and a folding and refolding of the epithelial and connective-tissue wall of the tubule. As the growths increase in size and number, they may extend from the cortex into the pyramidal portion and thence into the pelvis of the kidney.

THE ALVEOLAR ADENOMA.

In this form tubular spaces of different sizes are found, which are lined by epithelium. This epithelium closely resembles that lining the convoluted tubes. Weichselbaum and Greenish insist that the alveolar adenomata commence in the convoluted tubes and that the capillary form commences in the collecting tubules; but although the growths differ originally in their genesis and histological structure, these authors state that they may later on pass into each other. This takes place from the papillary excrescences being pressed so tightly together that

they merge into each other and the two halves of papillæ facing each other uniting at the ends form alveoli.

The degenerative changes found in adenomata are common and various. Few new-growths present so frequently and in so many forms retrogressive metamorphosis. Both the macroscopical and the microscopical appearances of the tumors become thus so much altered that they lose all resemblance to the primitive growth, and their identification would become impossible if we were not able to follow the transitional stages in their transformation. In the multiple type of the growths, through these different changes in the different tumors, there results a remarkable variation in color, consistence, and character of the tissue in different parts of the organ. This is unequalled in any other process in the kidney

The fibrous degeneration is one of the most frequent of the changes occurring in adenomata. In this the fibrous trabeculæ in the papillary variety, or the fibrous septi in the alveolar, increase in thickness and at the same time contract, thus compressing and finally producing degeneration and sometimes absorption of the epithelial cells. In this manner in some portions of the growth, or in some of the growths, the cells may all disappear, and the tumor attains almost the consistence and appearance of a fibroma. Another common change is the fatty degeneration. In this the epithelial cells are more or less completely filled with large and small fat-globules. The cells may, in this manner, be almost entirely destroyed, and the tumor acquire a bright-yellow color. Microscopically, it resembles sometimes quite closely fat-tissue.

The degenerative processes may result also in cyst-formation. The new-formed tissue undergoes a fatty and granular disintegration; this detritus becomes suspended in serum, forming a milky fluid, and the capsule of the tumor forms the cyst-wall; or serum may transude into the alveolar spaces, thus producing a dilatation of them. Colloid matter may also be found in these cysts. Again, when the vessels are numerous and thin-walled hæmorrhages may take place into the tumor, the spaces become filled with blood, and thus either a cavernous tissue is formed or a blood-cyst, or finally, a pigmented connective-tissue cicatrix.

As regards the causation of adenomata, Sturm and Labourin have directed attention to their almost constant association with the non-inflammatory new tissue-formation found in the kidney in middle or advanced life. Further than this observation, any assumptions as to their causation are purely speculative.

Adenomata are commonly benign growths, but Delafield and Prudden (l. c.) say that "there are larger tumors involving the whole kidney and accompanied with metastatic growths in other parts of the body which have the same structure as the papillary adenomata."

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THE CONDITION OF THE HEART IN ANÆMIA, AND THE CAUSE OF THE PULMONARY MURMUR.

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THE subject which I wish to bring forward is the cause of the pulmonary systolic murmur, so constantly present in anæmia. And in order to give the grounds for the views I hold upon this question, it is necessary for me to go more fully than I otherwise should have done into the general question of the condition of the heart in anæmia. Some of the following observations are capable of direct proof; and in support of the rest much evidence may be called, though it falls far short of proof.

1. Anæmia is a frequent and sufficient cause of fatty degeneration of the heart and of dilatation of its cavities.

Simple anæmia is but rarely fatal. I can, therefore, offer no post-mortem evidence from my own observation as to the condition of the heart-muscle under these circumstances. However, Walshe, Ormerod, Virchow, Ponfick, and many others all testify to the influence of anæmia in producing fatty degeneration of the heart.

Dr. Goodhart (*Lancet*, vol. i., 1880) expresses the view that in all forms of anæmia in women the heart's impulse becomes diffused and displaced outward; the heart-muscle undergoes fatty degeneration; and the heart, especially the left ventricle, becomes dilated. And he has demonstrated post-mortem in five instances that simple anæmia from loss of blood, in adults of both sexes and of very varying ages, is constantly associated with fatty degeneration of the ventricular walls and dilatation of the cavities, especially the left.

Dr. Bristowe says: "Dilatation, which is sometimes the primary change in hearts that are simply feeble, not only impairs efficiency, but actually furnishes an incentive to cardiac exertion and overgrowth."

2. *In a definite class of cases of anæmia, including chlorosis, cardiac dilatation is a constant and important condition which urgently requires more general recognition and treatment.*

Very little space is devoted to this subject in most of the text-books, and but little importance is as yet attached to it. Consequently, like many others, I was left to find it out for myself; but when once my attention had been directed to it, I found that it had been dealt with in several special articles.

During the last four years I have carefully examined into the state of the heart in five-and-thirty cases of simple anæmia, chiefly in young females, that have been under my care in the Nottingham General Hospital. Each case was under observation for several weeks, and a few for a much longer time. And during the same period I have made similar observations in a much larger number of cases of anæmia due to various cachectic conditions. And as a result I am able most confidently to confirm Dr. Goodhart's statement, at any rate so far as to say that in chlorosis and the simple anæmia of young women the heart's impulse becomes diffused and displaced outward almost invariably. But, contrary to his experience, I think the clinical signs point in these cases to the dilatation affecting chiefly the right side.

3. *In such cases the right side is often the one chiefly affected.*

I have come to this conclusion because the heart's impulse is invariably displaced outward, but generally little, if at all, downward. The apex-beat (that is, the part of the impulse farthest to the left and downward) is, in the vast majority of cases, in the fourth space, sometimes in the fifth, but I have never found it in the sixth. In horizontal positions the apex is usually in the nipple-line, or a little outside it, but it varies from a half inch inside to one and a half inches or more beyond it. To compensate for the variable position of the nipple I have always made in addition actual measurements, and have found the apex-beat from three and a half to four and three-quarters inches, or further, from mid-sternum. The most forcible pulsation is often in the third space, about one inch inside the nipple-line; and I attribute it to the impact of the middle or upper part of the anterior wall of the right ventricle, and not to the auricular appendage. Rindfleisch,¹ in speaking of hypertrophy of the right ventricle, says: "The heart's apex is no longer formed by the left ventricle alone; it is partly, or even wholly, formed by the right one. The apex-beat often becomes indistinct; in its stead we find a basic impulse due to the contact of the conus arteriosus with the chest-wall during each systole, in consequence of the enlargement of the base of the heart in its antero-posterior diameter."

In well-marked cases, especially those occurring acutely and to which over-exertion has contributed, there is often a systolic murmur with its

¹ Pathology. Sydenham Society's Translation. Vol. i. pp. 270, 271.

point of maximum intensity over the fourth left costal cartilage. This, I take it, indicates regurgitation through the right auriculo-ventricular orifice. And this view is confirmed by the turgid condition of the external jugulars, especially the right, which pulsate synchronously with the heart and fill from below.

4. *There are many forms of anæmia, in some of which there are heart-murmurs, and in some not; in some the heart is enlarged and dilated, and in others not. Where the heart is dilated, several different conditions contribute to bring about this result. There are several different murmurs in anæmia, one or all, or none, of which may be audible in a given case. Hence, partly, the divergence of opinions.*

Typical chlorosis I believe to be in the first instance largely, if not entirely, a developmental disease, and, hence, occurring at or about puberty, before development is completed. In one class of cases, severe in point of intensity but limited in numbers, the essential lesion is a "hypoplasia or congenital narrowness of the aortic system." This view, originally expressed by Virchow, has been confirmed by Rokitsky, Bamberger, Quincke, and recently by Fraentzel. In the *Practitioner* for 1889 I recorded a well-marked example, together with the post-mortem conditions. The heart varies much. At times when the general development is poor and there has been no undue bodily exertion, and the affection has lasted but a short time, the heart is abnormally small, corresponding to the dimensions of the aorta, like the heart of a child. At other times, especially when there has been rapid body-growth, underfeeding, and a call for over-exertion, the heart is enlarged, dilated, and hypertrophied. "The vascular walls and their contents are both derived from the same mesoblastic tissues of the embryo. Let us suppose the unborn defect of developmental energy to extend not merely to the blood, but to the cellular lining of the vascular tree as well. A hypoplasia of the vascular system will then be inevitably associated with the hypoplasia of the blood."

In many, indeed in the great majority of cases of chlorosis, the full development of the aortic system is only *delayed*: and the patients eventually get quite well. The ratio of the different organs to one another varies in different individuals, and only approximately approaches a perfect type. In some the brain and nervous system predominate; in others the chest and respiratory system are unusually well developed. Some have a large bony framework; and yet in others, the liver or the kidneys are always "inadequate."

Between the ages of twelve and fifteen in the female, growth and development proceed with extraordinary rapidity; stature and weight being both actually and relatively greater than at corresponding ages in the male. In some cases the development of the vascular system may lag behind the requirements of the body. With this condition, or even with only the feebleness of rapidly growing tissues, much physical exer-

tion (in maid-servants in running up and down stairs; in girls of a better class in playing tennis, etc.) may result in cardiac dilatation.

It is well known that the development of the various organs does not proceed *pari passu*, and that various causes may disturb or delay its progress. I have seen the uterus of a girl of seventeen, who had died of phthisis, indistinguishable in point of size and shape from the uterus of a nine months' fœtus placed beside it, and only to be recognized by the condition of the ovaries. In some cases gastric ulcer or persistent gastric catarrh, in others want of fresh air, may by interference with general nutrition, lead to a similar delayed development of the arterial system, and through that to cardiac dilatation. It is well known that in some forms of heart affection occurring in early life, more especially in mitral stenosis, the aorta, and the arterial system generally, remain imperfectly developed. There is a general hypoplasia of the aortic system. I have myself met with many well-marked instances. Balfour says:

"There is every reason to believe that mitral stenosis is by no means infrequently congenital . . . and that in these instances it is invariably associated with hypoplasia of the aortic arterial system, and consequently of the body generally."

And again:

"But should a rheumatic attack in childhood or early youth be followed by any considerable mitral stenosis, the effect of this must be to accumulate blood behind the stenotic valve, to diminish the wave of blood sent forward, and thus to lessen the normal distention of the aorta, and to impair the nutrition of all the tissues, producing that retarded development so well known as the constant result of serious cardiac disease occurring in early life, technically termed hypoplasia, affecting primarily the aortic arterial system, and secondarily all the organs of the body."

Dr. Clifford Allbutt has called attention to the influence of under-feeding in producing degeneration of the heart and consequent dilatation. This, of course, applies to both sexes and all ages, but it is specially applicable to chlorosis, in which condition the capriciousness and perversion of the appetite are notorious. But in a far larger number of cases, in which an accusation of capriciousness or perversion of appetite could hardly be sustained, it is a noticeable and very important fact that these anæmic girls take a dislike to the more highly nitrogenous forms of food—meat, fish, milk—and habitually omit them from their dietary. It is probable that the undue prominence of the carbohydrates, and the comparative absence of the albuminates in the food, has at least as much influence in producing the *embonpoint* so general in chlorosis, as the want of exercise and deficient oxygenation of the blood and oxidation of the tissues to which it is so generally attributed.

It is now widely recognized that in many forms of anæmia, though by no means in all, and possibly not to a well-marked degree in all the ex-

amples of the same form, there is a distinct rise in the vascular tension. This is readily perceived by the finger on the radial pulse; but it is still more distinctly shown by the use of the sphygmograph. I have several tracings which show a distinct rise in vascular tension, and many others which show a tension quite up to the normal. These tracings are of the more value because one of the commonest complications in the interpretation of sphygmographic tracings is practically eliminated in these young patients, viz., rigidity and degeneration of the walls of the vessels. The increased tension is so contrary to one's preconceived ideas that it was very slow in gaining acceptance. The causes of it, and more especially its presence in some cases and its absence in others, are not easy of explanation.

It has been shown by Eberth and Schimmelbusch, and more recently and more completely by Professor Hamilton, of Aberdeen, that alterations in the blood may result in a considerable impediment to its free circulation. In healthy blood, the specific gravity of the colored corpuscles is nearly alike with that of the plasma, while that of the colorless is considerably less. Consequently the colored corpuscles keep mainly in the axial stream, while the colorless keep largely in the periphery. Any alteration in the constitution of the blood, either in the plasma or in the colored corpuscles, which form the enormous majority, such as to make the corpuscles either specifically lighter or heavier than the plasma, causes them to move less in the axial and more in the peripheral stream, makes them touch and roll along the sides of the vessel, and very greatly increases the amount of friction, which consequently entails a corresponding increase in the propelling power. There is much reason to suppose that in some forms of anæmia such alteration in the relative specific gravity of the corpuscles and the plasma does occur. In the majority of these chlorotic forms of anæmia the red corpuscles are little, if at all, reduced in number, but are very deficient in hæmoglobin.¹ That makes it extremely probable that they are also reduced in specific gravity, but I believe that point has not been proved yet. Hence, in all probability, the high-tension pulse of anæmia, and, to some extent and in certain cases, the consequent dilatation and hypertrophy of the heart.

The anæmia of malignant disease, of phthisis, of cachectic conditions, and of chronic wasting diseases, is more complex. The total volume of the blood is diminished. The corpuscles and the plasma suffer more nearly in equal degree. There is less capacity for exertion, and so less strain is thrown on the heart. The general nutrition is more gravely impaired. The heart has insufficient pabulum, and so atrophies in correspondence with the general wasting of the body. In these cases, however profound the anæmia, there are generally no cardiac murmurs.

In post-febrile anæmia I have already elsewhere² referred to the fre-

¹ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, May, 1890.

² Provincial Medical Journal, July, 1890, p. 395.

quency of cardiac degeneration and dilatation, and to the variability of the murmurs.

In cases of anæmia of recent origin, where there has not been sufficient time for dilatation and enlargement of the heart to ensue, there are generally no cardiac murmurs. I have noticed this on many occasions. I may quote two examples:

An unmarried girl, aged eighteen, who had been confined in the work-house, was shortly afterward admitted into the general hospital with the most profound anæmia, but there was no trace of a cardiac murmur, and no evidence of dilatation or enlargement. She soon got quite well.

A married woman, aged twenty-two, was admitted suffering from most marked anæmia of recent origin, due to metrorrhagia and over-lactation. There was no trace of a cardiac murmur or of enlargement of the heart, and the pulse tension was low. She soon recovered completely.

In these and similar cases the absence of enlargement of the heart may be in part due to rest and absence of exertion from the commencement of the anæmia; and to general failure of nutrition, tending to atrophy of the heart; as well as to the recent origin of the anæmia.

In what I may call, for want of a better term, "gastric cases of anæmia," dilatation of the heart and cardiac murmurs are slight or absent. By "gastric cases of anæmia," I mean those which commence with or are early associated with gastric ulcer or chronic gastric catarrh. In these the general nutrition usually fails, and the state of the heart is one of atrophy rather than of hypertrophy, and hence cardiac murmurs are absent. In these various forms of anæmia where the heart is dilated or hypertrophied, or both, I conceive the change to be due to one or more of the following causes:

1. Congenital narrowing, or delayed development of the aorta, and the aortic arterial system, requiring greater pumping power to supply the needs of the circulation.

2. Increase of resistance in the peripheral part of the circulation from unequal changes in the specific gravity of the component parts of the blood. (These two classes include most of the cases of high-tension pulse.)

3. Malnutrition and degeneration of the cardiac muscle from the circulation through its walls of blood deficient in some of its proper constituents. A larger bulk of this flabby, degenerated, or relaxed muscle¹ is required to do the same amount of work as a smaller bulk of normal muscle in good tone will do. Hence hypertrophy rapidly follows on dilatation.

¹ Balfour: Diseases of the Heart, p. 156. "In chlorosis, and after fevers, etc., the change in the condition of the heart consists in such a complete relaxation of its tissues that in its most extreme form it seems as limp as a piece of wet paper."

4. Overwork, especially associated with constriction of the chest and waist, as is usual in females. (Constriction of the chest during exertion apparently favors cardiac and arterial disease in soldiers.)

There are many different cardiac murmurs commonly audible in anæmia, but, so far as I know, they are all systolic in rhythm. The commonest, and the one most typical of anæmia, is that with its point of maximum intensity in the pulmonary area. The cause of it I shall discuss later.

The next most frequent murmur is at the left apex, and is a true regurgitant murmur, due probably in most cases to relaxation and dilatation of the left ventricle and relative incompetence of the mitral valve. Rheumatism is very common in anæmia, and in some of these cases there is probably rheumatic valvulitis.

A systolic murmur is not uncommon, too, in the tricuspid area, due in all probability to dilatation of the right ventricle and relative incompetence of the tricuspid valve.

A systolic murmur over the aortic cartilage is, in my experience, rare in these cases, and is then often permanent and apparently due to organic disease, except in those instances where it is only communicated from the pulmonary area, and is not independent. These murmurs disappear in the following order, viz.: tricuspid, mitral, aortic, pulmonary.

Thus, there are several distinct murmurs in anæmia, and this has led to much confusion in the discussion of their etiology. The most characteristic murmur is the pulmonary, and of that I shall have more to say shortly.

5. *The pulmonary, so-called hæmic, systolic murmur is not due directly to a change in the blood.*

There are three distinct classes of murmurs called hæmic, namely: the venous, the arterial (those produced at the orifices of the pulmonary and aortic arteries), and the purely cardiac (those audible over the mitral and tricuspid openings); and they have all been for many years attributed to an altered condition of the blood.

That this is a satisfactory explanation in the case of the venous murmurs most admit, although they may not agree as to the exact nature of the alteration. It seems probable that the change is more in the direction of diminished quantity than in altered consistence, and that the murmur is due to imperfectly filled vessels.

1 Balfour says: "All the ordinary murmurs are not infrequently found associated in chlorosis with a true murmur of mitral regurgitation distinctly and clearly audible in the mitral area, and accompanied by distinct accentuation of the pulmonary second sound. And these murmurs disappear in the exact order in which we should expect them to do so; first the mitral murmur vanishes, then the murmur in the aortic area ceases, next the auricular murmur disappears, and, last of all, the venous murmurs become inaudible."

The cause of the arterial murmurs is a more complex problem. I am not prepared to say that diminished volume of the blood plays no part, but it is not sufficient to explain all cases.

It has been stated by Richardson, as a result of experiments, that if an animal be bled until it is feeble, an anæmic murmur becomes apparent; *while if large quantities of saline solution be injected into the vessels*, so as to compensate for the loss, the murmur does not disappear. Much has been founded on these and similar experiments to prove that the altered condition of the blood has, in some way, to do with the generation of the abnormal sound in man. But it is never safe to reason directly from animals to man. And, fortunately, we have in diabetic coma the opportunity for a direct experiment on man to elucidate the point in question. Recently, in a case of diabetic coma in a woman aged twenty-five, Dr. Dickenson introduced into the veins of the arms 106 ounces of saline fluid in the course of one and a half hours. Next day, the patient having relapsed into a state of coma, 350 ounces were allowed to flow from a funnel into the veins of the leg. The patient recovered consciousness completely after three-quarters of an hour, but ultimately died. Within the space of thirty-two hours 456 ounces of saline fluid had been introduced into the veins. *The heart-sounds were feeble, but there was no murmur either in it or the great vessels.* And yet the blood must have been very hydræmic.

Further, in a case of pernicious anæmia lately under my care, in a boy aged sixteen, with lemon coloration of the skin and conjunctiva and abundant retinal hæmorrhages, and where the colored corpuscles fell at one time as low as 154,655 per c. m., the pulmonary systolic murmur was never loud and distinct, and was, during a great part of the time, difficult to catch.

6. *The characteristic of the so-called hæmic, pulmonary murmur is that, though audible frequently in all the areas, its point of maximum intensity is in the second or third left interspace (usually the second), close to the sternum; and that it invariably becomes much less loud, and frequently totally disappears in the erect position.*

In the early part of 1888, I was much surprised at the sudden disappearance of one of these pulmonary murmurs.

The patient was an anæmic maid-servant who had been admitted into the General Hospital, Nottingham, on account of syncopal attacks. There was well-marked dilatation of the heart, and a loud systolic murmur with its point of maximum intensity in the pulmonary area. The patient gradually improved, though the murmur did not alter much. She was allowed to get up. A few days later I examined the heart while the patient was standing. There was no murmur to be heard, and I congratulated myself and the patient on the rapid reëstablishment of a healthy cardiac state. A day or two later I happened to examine

the chest again before the patient got up. The murmur had returned, and was as loud as ever. The thought suddenly struck me that the variability of the murmur was due to the influence of position. I made the patient stand, and the murmur became inaudible. On lying down again, it returned at once.

Since that date I have made hundreds of observations to test this point, and have full records of between thirty and forty cases of anæmia in which this phenomenon has occurred.¹ And the result of my experience is that in all cases of anæmia in which the pulmonary systolic murmur is present, it becomes much less loud in the erect position, and that in the majority it either totally disappears or leaves only an impure or murmurish first sound which might easily escape observation; but that the murmur returns at once on the patient assuming the recumbent position.

It is sometimes accompanied by pulsation in the episternal notch, and almost always by pulsation in the second, third, and fourth intercostal spaces near the sternum. The murmur is intensified by raising the patient's hips or the foot of the bed. It is unchanged by turning the patient on the left side. The murmur generally becomes much fainter when the patient lies on the right side, and *disappears when she turns on the face*. On the patient standing the heart is apt to palpitate, or at least become unduly accelerated. Under these circumstances observations are difficult. The murmur usually disappears, or, should it remain, it becomes difficult to differentiate.² After a few minutes the heart usually quiets down, and then more accurate observations can be made. It has been noticed by several observers that these pulmonary murmurs usually disappear during full inspiration,³ especially if the patient holds the breath. An explanation of this will be suggested later. It is the contrary of what usually happens in apex-murmurs.

7. This pulmonary systolic murmur, disappearing in the erect position, is due to the pressure of an enlarged, flabby, and dilated heart on the pulmonary artery.

¹ Gee says: "Murmurs audible in the horizontal position sometimes become much less loud and long in the erect—nay, occasionally altogether cease. This is most frequently the case with presystolic murmurs produced at the mitral orifice. The reason of the occurrence is not quite clear. I have not been able to find any statement in the text-books that this applies especially to the pulmonary, so-called hemic, murmurs. Nor can I ascertain that such a view is at present the teaching of the schools. In fact, singularly little practical importance seems to be attached to the 'influence of position on cardiac murmurs,' although several monographs have been written on the subject."

² Gee states: "Murmurs are loudest sometimes when the heart beats forcibly, sometimes when it beats quietly."

³ Gee says: "The loudness of murmurs is sometimes under the influence of breathing; thus, a systolic apex-murmur may be much louder during inspiration than during expiration."

On thinking over this strange variability of the anæmic pulmonary murmur, according to the position of the patient, a variability not found with anything like the same frequency or to the same degree in other murmurs, even the presystolic, it seemed to me that the only possible explanation of the murmur disappearing in the erect and in the prone positions, was that it was caused by the pressure of the heart—especially of an enlarged and flabby heart—on the pulmonary artery. This pressure may be increased somewhat during the systole by the “base-beat.” I suppose the pressure to be communicated chiefly through the fibrous ring surrounding the orifice of the pulmonary artery. The counter-pressure would be partly the general fixity of the pulmonary artery by the passage of its branches into the roots of the lungs, and partly the arch of the aorta, in which the vascular tension is higher and therefore the vessel firmer, and which is held in position by the large branches coming off from it and by the general connective-tissue investment. This view somewhat resembles Russell’s theory, with which I was unacquainted at the time, but the points of difference will be explained later on.

The explanations of the cardiac murmurs of anæmia have been many and various.

Marey supposed these bruits to be due to a diminution of arterial tension facilitating the production of sonorous veins at the arterial orifices. Clinical medicine convinces us that diminution of arterial tension is not sufficient to account for the production of a murmur; and, moreover, in many of these cases of anæmia we have seen that the arterial tension is raised.

Naunyn’s theory, adopted by Balfour, is that the murmur is due to regurgitation through the mitral orifice into the left auricle, and that the point of maximum intensity of the murmur is not over the pulmonary artery, but one and a half inches or more to the left of the left edge of the sternum, where the appendix of the left auricle comes up from behind. In my own experience the point of maximum intensity has been, in the majority of instances, over the pulmonary artery, or over the conus arteriosus near the sternum, and not so far to the left as described by Naunyn and Balfour. I am not satisfied that there is any sufficient evidence that the left auricular appendage, unless in very exceptional instances, does come into contact with the chest-wall, but I believe as far as my own observations guide me, that in the vast majority of cases it is covered by lung. And, furthermore, the dilatation of the right ventricle so common in anæmia tends to push the left auricle still more to the back. But the strongest ground of all for rejecting this theory is, that in no small proportion of cases a systolic murmur, differing in character from the pulmonary one, can be heard at the apex, and is propagated for one or two inches toward the axilla, while the pulmo-

nary murmur is audible in the usual position at the same time. The pulmonary murmur disappears on the patient standing erect, the apex murmur does not. And in many cases, after suitable treatment by rest, etc., the apex murmur disappears even in the horizontal position, while the pulmonary murmur remains for some weeks longer. This seems to me sufficient evidence of the independence of their causation. There can be little doubt that the apex murmur is due to regurgitation through the mitral orifice, in some cases from shrinking of the valve from valvulitis; in most, probably, from dilatation of the orifice, or from inefficient contraction of the muscles of the base (McAlister), or from general relaxation of the muscular tissue. In these cases, at any rate, the pulmonary murmur must be explained by some other cause, for it is unreasonable to suppose that regurgitation through the mitral orifice can produce two different murmurs at the same time, heard best in different areas, propagated in different directions, and one disappearing while the other remains.

Broadbent traces the cause of these murmurs to high arterial tension, owing to which the ventricle is unable to empty itself, and hence dilatation follows.

Bristowe (*Proceedings of the Medical Society of London*, vol. xi., 1888), speaking of the "murmurs often termed 'hæmic,' which are generally best heard about the sternal end of the cartilage of the left third rib," says:

"How it is caused I do not pretend to decide. That it is directly due to altered quality of the blood I do not in the least believe. I should think it is connected with some want of due relation between the quantity of blood expelled from the ventricle in a given time, and the size or tension of the pulmonary artery, allowing of the development of coarse vibrations of the contents and walls of that part of the circulatory apparatus over which it is best heard."

Russel, while not disputing that the murmur heard in a large proportion of cases of debility, due to causes such as chlorosis, fevers, and parturition, is excited by mitral regurgitation owing to laxity of the ventricular walls, yet denies that its mechanism as expounded by Balfour is correct. It is not generally heard at the apex, the point where mitral murmurs are usually loudest, and it has not the purely soft blowing character of a murmur arising in this neighborhood. It also gradually disappears during inspiration. He explains its mechanism rather on the assumption that the left auricle becoming distended from the mitral regurgitation, presses injuriously on the pulmonary artery, and throws its blood into a state of sonorous vibration.

To this theory it may be objected that there is no evidence that the left auricle is distended in all the cases of anemia in which the pulmo-

nary murmur is distinct. As I have said before, in very many cases there is no apex murmur at any time, and in others it disappears before the pulmonary. In a large number of cases, therefore, the pulmonary murmur has to be explained in the absence of any evidence whatever of regurgitation through the mitral valve, and consequent distention of the left auricle. And in the very large number of cases of chronic heart disease from incurable mitral regurgitation this murmur is not present, notwithstanding that one may be assured that the left auricle must be dilated.

Furthermore, in mitral stenosis, when the left auricle is greatly distended, a systolic murmur in the pulmonary area, or in the third space, is exceptional.

Balfour says :

“Not unfrequently, a systolic murmur with its point of maximum intensity in this situation (*i. e.*, an inch to the left of the left edge of the sternum in the second space) is due to the regurgitation almost always present in mitral constriction, many circumstances favoring in these cases the convection of this murmur upward to what we may term the auricular area, rather than its mere reduction outward into what is termed the mitral area. These being the great dilatation of the appendix auriculi, and the concomitant tendency of the left apex to become depressed within the chest by the distended right ventricle, which, in all these cases, is usually more or less *dilated*.”

I believe that this murmur is not due to regurgitation through the mitral orifice, but to the dilatation of the right ventricle already alluded to, and to the weight and base-beat of the heart pressing on the pulmonary artery.

Balfour relates the case of a man with mitral stenosis, in whom there was a presystolic murmur audible at the apex, and a loud, rough systolic murmur in the pulmonary area. The systolic bruit became always very faint, and occasionally inaudible; on the patient assuming the erect posture, the presystolic bruit remaining unchanged. And he suggests that this was possibly because in this position the necessary compression of the pulmonary artery was prevented by the heart's weight dragging it down.

Quincke,¹ of Berlin, has related a case of mitral stenosis in which a pulmonary systolic murmur was present. He attributed it to hypertrophy without dilatation of the right ventricle, together with dilatation of the pulmonary artery, the murmur arising at the orifice of the pulmonary artery from the formation of a fluid vein. In this case the auricular appendix was thrombosed and lay deep in the chest; the

¹ Balfour, p. 197. I have had no opportunity of referring to the original, Beiträge zur Entstehung der Herztöne und Herzgeräusche, Berliner klin. Woch., 1870, No. 21, S. 249.

auricular origin of the murmur from convection was therefore precluded. But the thrombosed auricular appendix would from its position readily become an instrument for compressing the pulmonary artery, especially when in the recumbent position a portion of the weight of the heart was communicated to it. I believe in this, as well as in the next series of cases related by Quincke, the essential condition is the dilatation of the right ventricle, and that the murmur is produced in some instances, perhaps, by the consequent *relative* stenosis of the pulmonary orifice; but in the majority by the actual stenosis of the pulmonary artery produced by the weight and upward pressure (base-beat) of an enlarged and flabby heart, communicated to the pulmonary artery through the fibrous ring surrounding the arterial orifice. All the conditions for this were present in Quincke's cases. Most of them were associated with debility. There was visible pulsation in the second left interspace, and there was an increase of the absolute cardiac dulness, which diminished *pari passu* with the disappearance of the pulmonary bruit. The murmur, too, disappeared when the pulmonary artery again became covered by lung, just as in chlorosis the murmur disappears during full inspiration. Quincke states that the systolic pulmonary murmur is accompanied by an uncovering of the base of the heart by retraction of the left lung from various causes, and he supposes that in these cases the systolic murmur is produced by compression of the pulmonary artery by the heart during its systole. The murmur is caused by the passage of the blood through the compressed and narrowed portion of the artery into the uncompressed and therefore comparatively dilated portion beyond, a state of matters which must be accompanied by the production of fluid veins at the part artificially narrowed; and which, therefore, if it exists, must be regarded as an efficient physical cause for the production of a systolic murmur. He bases his views as to the possibility of the production of this artificial narrowing, first, upon the fact that the pulmonary artery could in all these cases be felt and seen to pulsate. Quincke attributes much importance in these cases to the "uncovering of the base of the heart by retraction of the left lung from various causes." And Balfour emphasizes this still more in his cases. He says:

"Now you will observe that all these cases agree in this, there was in every one of them retraction of the left lung, and uncovering of the heart and pulmonary artery, the exposure of the latter permitting its pulsations to be readily seen and felt. . . . The uncovering of the pulmonary artery also brings the valves nearer the surface; hence their closure is not only more easily felt, but also more easily heard."

This explains the *normal* sounds being more loudly heard, but does not account for the production of a murmur. I believe that in anæmia the uncovering of the heart and pulmonary artery, so far as it occurs, is

due to the lung being pushed away by the enlarged heart. Where the lung is retracted from disease of its own tissues the heart gets more room, and is allowed more play, and hence without being enlarged or dilated may, in the recumbent position, fall back and press on the pulmonary artery sufficiently to cause a murmur. On this theory the disappearance of pulmonary murmurs, when the breath is held after a full inspiration, would be only partly due to imperfect conduction of the murmur from the heart and pulmonary artery being well covered by expanded lung, but largely also to the heart being better supported by the increased size and increased tension of the pulmonary air-cushion, and prevented from falling back.

Balfour speaks of the "auricular murmur as of such frequent occurrence in all febrile disorders, depending upon a slight degree of cardiac dilatation, and this has been occasionally, though rarely, accompanied by a murmur of similar origin audible in the mitral area." That febrile, or post-febrile cardiac dilatation should lead to a regurgitation through the mitral orifice causing a systolic murmur with its point of maximum intensity sometimes in the auricular area, and sometimes at the left apex, and sometimes equally audible in both, requires further explanation. The fact that these murmurs are heard as described is beyond question, but it seems much more reasonable to attribute the auricular (pulmonary?) murmur and the apex one to different and independent causes, as they are shown to be audible independently. I prefer to suppose that the so-called auricular murmur is in reality pulmonary, and that it is due to pressure on the pulmonary artery.

In further support of the opinion that these pulmonary systolic murmurs are produced by pressure on the pulmonary artery, I may refer to the widely-recognized fact that in certain instances of pleuritic effusion a basic systolic murmur is produced by the pressure of the fluid. Dr. Douglas Powell (*Diseases of the Lungs*, pp. 82, 83) thus describes it: "In cases in which the heart is greatly displaced by pleuritic effusion a systolic murmur is developed over its base, which disappears on removal of a portion of this fluid, and is presumably due to a straightening or slight tension of the great vessels from pressure of the fluid."

And as an example of the production of just such a murmur as we are considering, by direct pressure upon the pulmonary artery, I may refer to a case of "Aneurysm of the Aorta opening into the Pulmonary Artery" which I reported in the *Edinburgh Medical Journal*, February, 1888, which affords almost an experimental proof of it. In this case the pulmonary artery was pressed upon half an inch above the valves by a small aortic aneurism, which eventually communicated with it. Here there was marked pulsation in the third left intercostal space from the dilated conus arteriosus of the right ventricle and a loud systolic murmur. This was noticed before there was any ground for supposing

that the opening of communication had formed, but while there was only pressure.

Before, however, this theory of the causation of the pulmonary systolic murmur by the pressure of an enlarged heart upon the pulmonary artery in the recumbent (supine) position can be accepted, it is necessary to show whether variations in bodily position influence the position and movements of the heart in the thorax. That is to say, whether the influence of gravity upon the heart does affect its pressure on neighboring organs. "In the healthy man, in the erect or sitting position, the heart, of course, lies on the diaphragm, suspended, however, a little by its base, which is attached by the great vessels and the structures of the spinal column. Owing to this arrangement of the parts it would seem, therefore, probable that variations in bodily position, or in the position of the diaphragm, might act through gravity upon the suspension of the heart, either lengthening it by allowing it to fall from its attachment, or shortening it by pushing it up and back, as it were, on its base." It is, of course, well known that the force and position of the apex-beat vary considerably in different positions of the body. But the influence of the position of the body on the position of the heart has been best shown by Mr. C. J. Bond, F.R.C.S., in some experiments both on the lower animals and on himself, a report of which was published in the *British Medical Journal*, December 12, 1885. By passing down the œsophagus an air tampon, connected by a tube with an air tambour and a recording apparatus, he was enabled to obtain tracings of the "base-beat" of the heart; and to show that it varied greatly in different positions of the body, and during inspiration and expiration. In describing a tracing taken while the tampon was in his own œsophagus, he says: "The smaller frequent rises (due to the cardiac beats) are more marked during expiration than inspiration, owing to the heart falling back toward the spine during expiration; further, these cardiac curves are very marked, especially on the summits of the expiratory rise at the left end of the tracing, while I was lying on my back with the head and shoulders depressed, and legs and pelvis raised, while they almost disappear in the sitting-up and prone positions, to reappear at the right-hand end of the tracing in the supine position."

In the next place, if the pressure theory has any foundation, why is not this pulmonary systolic murmur present in all cases of enlargement of the heart? In reply to this, I must say that a full explanation is wanting, but that it is present in some cases. I conceive a predominant dilatation of the right ventricle to be necessary, a condition not common in chronic heart disease. I have already mentioned that a systolic murmur with its point of maximum intensity in the second or third space, is not unfrequently audible in mitral stenosis—an affection which entails dilatation of the right ventricle, and not of the left.

I have also found it in the following case, which is typical of a class :

A man, aged forty-eight, has been under observation at frequent intervals during the past three years. He has chronic Bright's disease and a dilated (? fibroid) heart. When compensation fails, and he gets dropsy and cardiac symptoms with very rapid heart's action, a systolic murmur over the right and left ventricles is constant, and he has orthopnoea. When the heart is rehabilitated, and its speed reduced to seventy, the murmur disappears. Now he is just recovering from his fourth attack of failure of compensation, but the right side (and probably the left also) is considerably dilated. The cardiac dulness extends far to the right of the sternum, the jugulars are extremely turgid, pulsate with the heart-beats, and fill from below. The speed of the heart has been reduced to between eighty and ninety, but it is still irregular. In the erect position there is no trace of a murmur. In the recumbent position a systolic murmur is constantly audible, with its point of maximum intensity in the pulmonary area. This has been confirmed by several observers.

In cases of chronic valvular disease the changes are complex ; the left side is generally more enlarged than the right, and may prevent pressure on the pulmonary artery by transferring the weight of the heart to the aorta. Possibly, too, a certain degree of relaxation or flabbiness of the heart-muscle is required. When the left ventricle is considerably hypertrophied, and is firm and rigid, the much smaller right is more like an appendage to it, and cannot in the recumbent position fall back and press on the pulmonary artery.

As examples of the unfavorable influence of the dorsal recumbent position on the heart, where there is no suspicion of orthopnoea, I may quote the following, both of which have recently been under my observation :

A man, tall, thin, aged thirty-four, with a faint apex systolic murmur, and the heart's action regular and of normal speed, has some cardiac pain ; but is able to take active exercise and ride a bicycle. When he sleeps on his back he frequently wakes suddenly with urgent dyspnoea, and cardiac pain and distress.

A very stout, short man, aged fifty-two, with regular heart's action and no murmur, suffers from anginal attacks on walking up hill. If he lies on his back, cardiac pain always comes on within a few minutes, and continues until some time after he has turned on the right side, or has sat upright, or leaned forward, which latter position is the easiest.

Possibly, too, the distress and somewhat rapid fatal termination in sheep that are " cast," is due to the pressure on the heart from the dorsal position.

8. By this test of position the pulmonary murmur, when loudly audible in the other areas in the horizontal (supine) position, can be distinguished from true regurgitant murmurs due to relaxation of the heart-muscle, or dilatation of its openings, or valvulitis.

9. *When in anæmia there are murmurs in all the areas, not due to permanent changes, they disappear during convalescence in a definite order, namely: first the tricuspid, next the mitral, then the aortic, and lastly the pulmonary.*

With judicious treatment the murmurs, except the pulmonary, may cease in a fortnight to six weeks; but the pulmonary murmur, though less loud and distinct than heretofore, is generally audible in the horizontal, supine position for several weeks, and sometimes months, longer, notwithstanding an increase of weight on the part of the patient seven to fourteen pounds or more, and a corresponding improvement in color and general condition.

10. *And lastly, it is probable that in some cases anæmic enlargement of the heart leads to permanent heart disease.*

In order to learn whether anæmic enlargement of the heart ever leads to permanent heart disease, it is necessary to keep the cases under observation for some years, and that I have not been able to do. Of two cases that I have been able to examine at the end of two years or more, one had a permanent aortic systolic murmur, and the other a mitral systolic, but the pulmonary murmurs had gone. There was slight enlargement. It is not improbable that if more cases could be followed out permanent alterations would be found to be more common. Dr. Goodhart has suggested that there may be some connection between the great predominance of mitral stenosis in females, and the heart-changes of anæmia. He says: "Anæmia, by the dilatation it sets up, and the regurgitation through the mitral valve, may be the etiological factor in the unexplained considerable minority of cases of mitral stenosis in women which cannot be attributed to rheumatism."

11. *Treatment.*

If the importance and extent of the heart-changes are recognized the treatment is not difficult. It may be summed up in a few words: Rest, food, aperients, iron. Complete rest in bed for a week or ten days, with half the day in bed for another week or fortnight, is a therapeutic measure of great value. The dietary has generally been deficient in albuminoids. Saline aperients appear to answer best. I do not believe digitalis to be necessary except when the heart's action is too rapid even during rest, and in those cases which have to be treated without the possibility of rest. In the latter, better results may be obtained with digitalis and iron than by iron alone.

THE TREATMENT OF INFLAMMATIONS OF THE MASTOID, WITH AN ANALYSIS OF EIGHTY OPERATIONS.

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IN the following paper I have made an analysis of eighty cases in which the mastoid was opened by me for inflammation, and of which I have notes; fifty-five of these have occurred within the last two and a quarter years. The notes of many others which I should have been glad to add have been lost from lapse of time or are buried beyond recovery in hospital records. These latter have played an important part, however, in my experience, and it is only proper to say here that my conclusions are based upon about two hundred and fifty operations. The cases here reported are not selected, but include every one which I can now recall.

I have included only cases in which the mastoid was opened for inflammation; cases of malignant disease are omitted.

The cases are readily divided into four distinct classes, based upon the external manifestations of the disease upon which our diagnosis and treatment must depend, and these classes are again subdivided according to the existing pathological conditions as determined at the operation.

Class I. includes cases in which there was no extension of the inflammation to neighboring parts, neither œdema, swelling, nor redness; These I have called cases without extension. Pathologically they are subdivided into:

- I. (a) Simple suppuration of the mucous membrane of the interior of the mastoid.
- (b) Suppuration of the diploë of the bone.
- (c) Caries and necrosis of the interior of the mastoid.
- (d) Osteo-sclerosis.

Class II. embraces the cases in which there was an extension of the inflammation outward through the external cortex, with the subdivisions:

- II. (a) Subperiosteal abscess, the cortex firm and imperforated.
- (b) Caries of the cortex.
- (c) Caries of the cortex and necrosis of the interior.
- (d) Caries of the cortex and caries of the interior.

Class III. includes those cases in which there was an extension of the inflammation forward through the anterior wall of the mastoid which forms the posterior wall of the osseous meatus, the subdivisions being:

- III. (a) Suppuration of the diploë of the bone.
- (b) Caries of the cortex.

Class IV. includes the cases in which the inflammation extended downward through the base of the mastoid, subdivided into :

- IV. (a) Subperiosteal abscess of the base of the mastoid, without caries of the cortex.
 (b) Subperiosteal abscess of the base, with caries of the cortex.
 (c) Cellulitis of the neck.
 (d) Osteo-sclerosis of the bone without pus, either subperiosteal or intra-mastoideal.
 (e) Phlebitis of the external jugular vein.

Two other classes of cases can be made on this same principle, although, as no instances occurred in this series, they do not appear in the tables.

Class V., including the cases of extension of the inflammation upward through the mastoid roof, subdivided into :

- V. (a) Subdural abscess.
 (b) Meningitis.
 (c) Encephalitis.

Class VI., the extension of the inflammation inward through the inner wall of the mastoid, with the subdivisions :

- VI. (a) Phlebitis and thrombosis of the lateral sinus.
 (b) Subdural abscess.
 (c) Meningitis.
 (d) Encephalitis.

A number of the following cases exhibited two or more varieties of disease, which will account for some apparent discrepancies in the totals.

Adopting the above classification, I find of the 80 patients there were in :

Class I. 11, showing 14 pathological phases of that class.

II.	51,	"	58	"	"	"	"
III.	5,	"	5	"	"	"	"
IV.	13,	"	16	"	"	"	"
	<u>80</u>		<u>93</u>				
Males	.	.	.	.	.	.	41
Females	.	.	.	.	.	.	39
							<u>80</u>

Of 71 patients in which it is specified, the diseased mastoid was :

Right side	.	.	.	.	.	.	36
Left "	.	.	.	.	.	.	33
Both sides	.	.	.	.	.	.	2
							<u>71</u>

Of 79 patients, there were :

	Males.	Females.
Under 3 years of age	2	2
Between 3 to 15	4	9
“ 15 “ 25	9	15
“ 25 “ 35	10	6
“ 35 “ 45	4	4
“ 45 “ 55	5	0
“ 55 “ 65	4	2
“ 65 “ 75	3	0

Of the 80 patients, there were :

Cured	62
Not cured	3
Died	7
Unknown	2
Unfinished	6
	<hr/> 80

The two unknown cases have imperfect histories, so that I cannot speak positively of them.

I have designated as cured those cases in which the mastoid healed perfectly, and in which no symptoms in the mastoid remained, and where the general health was perfect. In the greater part of them the otorrhœa was also cured, but, unfortunately, this fact was not as thoroughly reported as it should have been, and I am unable to give the statistics in this regard. The result on the hearing is also not reported here, but this has no bearing on the operation, but is rather dependent upon the condition left by the tympanic disease, the amount of destruction of the drum-membrane, the restoration of this destruction, the condition of the rest of the conducting mechanism, and the efficiency of the labyrinthine structures. In no case have I seen any reason to believe the operation had any injurious influence on the hearing; and in most cases, by reducing the inflammation of the tympanum, the ear was placed in the most favorable condition for performing its functions, so far as the already existing injuries of the acoustic apparatus would allow.

I have called those cases chronic in which the mastoid symptoms, not the tympanic, had existed for two months or more.

A classification of all the cases follows:

		Acute.	Chronic.	Cured.	Not cured.	Died.	Unfinished.	Unknown.
Class I.	a, 5	5	0	5	0	0	0	0
	b, 1	1	0	1	0	0	0	0
	c, 2	0	2	0	0	0	2	0
	d, 6	2	4	3	0	1	2	0
	14	8	6	9	0	1	4	0
Class II.	a, 4	4	0	4	0	0	0	0
	b, 44	31	10 ¹	36	3	2	3	0
	c, 6	2	4	6	0	0	0	0
	d, 4	2	1 ²	1	1	1	1	0
	58	39	15	46	4 ¹	3	4	0
Class III.	a, 2	2	0	1	0	1	0	0
	b, 3	2	1	1	0	2	0	0
	5	4	1	2	0	3	0	0
Class IV.	a, 4	2 ³	0	4	0	0	0	0
	b, 7	7	0	6	0	0	1	0
	c, 3	3	0	3	0	0	0	0
	d, 1	1	0	1	0	0	0	0
	e, 1	1	0	1	0	0	0	0
	16	14	0	15	0	0	1	0

Three cases were not cured; in all of them caries and an open fistula remained; although all urgent symptoms, the original cause of the operation, were relieved. In one of these, No. 19, the treatment was broken off within four weeks after the operation from unavoidable causes; in another, No. 58, a cholesteatomatous mass formed, requiring a second operation, which the patient refused; in the third, No. 43, in spite of long-continued treatment, caries still exists and will probably require a second operation.

Of the 7 cases which died, 5 had active brain symptoms at the time of operation, 1 had bilateral mastoiditis with evident subperiosteal abscesses on each side, but refused operation for eighteen days, till too late, and died of meningitis; 1 died eleven days after operation from purulent meningitis, probably septic from acute caries of the whole petrous bone. Autopsies were obtained in two of the cases, and the diagnosis of meningitis confirmed; in four others the symptoms of meningitis were so pronounced that there was scarcely room for doubting the diagnosis; in the last case the symptoms rather pointed to abscess of the brain.

It can be asserted of 5 of the 7 fatal cases, that the brain-disease had already set in at the time of operation, and the operation was undertaken to give the patient any possible benefit from the evacuation of pus. In the sixth case the operation was delayed for two and a half weeks, notwithstanding warning of the great risks of delay. In the seventh case

¹ Unknown whether acute or chronic, 3.

² Unknown whether acute or chronic, 1.

³ " " " " 2.

⁴ One case is duplicate.

the whole petrous bone was in a state of acute ostitis, which finally infected the meninges, death being due to very intense purulent meningitis, which set in eleven days after the operation.¹ In none of the cases can the fatal result be connected with the operation.

The classification of the fatal cases was as follows:

Class I. (a)	.	.	.	.	1 acute.	
Class II. (b)	.	.	.	.	1 "	1 chronic.
	(d)	.	.	.		1 "
Class IV. (a)	.	.	.	.	1 "	
	(b)	.	.	.	1 "	1 "

Of the unfinished 6 cases, 3 are cured since these statistics were compiled, and the other 3 are doing perfectly well, now several weeks since the operation.

There are several practical questions in connection with the operation which it is of interest to investigate. Granting that suppuration within the bone endangers the integrity of the bone and the life, and that the evacuation of pus is indicated on general surgical principles, in what proportion of the cases was pus found?

	No. of cases.	Pus.	No pus.	Cortex normal.	Osteo-sclerosis.
Class I. a,	5	5	0	3 ²	1
b,	1	1	0	1	0
c,	2	2	0	0	2
d,	6	4	2	0	6
Class II. a,	4	3 ²	...	4	0
b,	44	44	0	42	2
c,	6	6	0	5	1
d,	4	4	0	4	0
Class III. a,	2	2	0	2	0
b,	3	3	0	3	0
Class IV. a,	4	4	0	3	1
b,	7	6 ²	...	5 ²	1
c,	3	3	0	2	1
d,	1	1	0	0	1
e,	1	1	0	1	0
	93	80	2	75	16

The two cases in which no pus was found were both cases of osteo-sclerosis.

One of the complications occasionally met with is a sclerosed condition of the bone, where, instead of a thin cortex, the bone is enormously thickened and solidified, which much increases the difficulty of reaching the antrum and the risk of accidents. In the 80 cases I met with this con-

¹ Reported in the Boston Medical and Surgical Journal, May, 1890.

² Unknown, 1.

dition in 12 individuals, showing 16 varieties of disease. A further analysis of these 12 cases follows:

	Acute.	Chronic	Cured.	Died.	Unfin- ished.	Antrum reached.	Antrum not reached.	Pus	No pus.
Class I. <i>a</i> ,	1	0	1	0	0	1	0	1	0
<i>c</i> ,	0	2	0	0	2	1	1 ²	2	0
<i>d</i> ,	4	2	3	1	2	5	1 ²	4	2
Class II. <i>b</i> ,	1	1	2	0	0	2	0	2	0
<i>c</i> ,	0	1	1	0	0	1	0	1	0
Class III. <i>a</i> ,	1 ¹	...	1	0	0	1	0	1	0
<i>b</i> ,	1	0	1	0	0	1	0	1	0
<i>c</i> ,	1	0	1	0	0	1	0	1	0
<i>d</i> ,	1	0	1	0	0	1	0	0	1
	10	6	11	1	4	14	2 ²	13	3

In three cases of sclerosis no pus was found. In one the antrum was not reached, but after penetrating to the depth of nine-sixteenths of an inch without reaching any cavity, further penetration seemed undesirable, and the opening was extended forward into the tympanum, where extensive caries existed, and a counter-opening was thus made, the caries removed by the dental engine, and now, two months after the operation, all exposed bone is covered, and the discharge has ceased. The case is included among the unfinished cases. In the second a purulent inflammation of the tympanum, with large central perforation, had been accompanied for two years with sensitiveness on pressure, with much, and often severe, pain in the mastoid and head, with frequent vomiting, vertigo, and great nervousness, which continued in spite of thorough and appropriate treatment. At the depth of five-eighths of an inch, through ivory-like bone, without a trace of pneumatic or diploëtic cells, the antrum was opened, but no pus was discovered. The case progressed most favorably, the pain disappeared in a week, and has not returned, now five months after the operation, the otorrhœa soon ceased, and the perforation healed. As there is still slight sensitiveness of the bone, this case also is included among the unfinished. In the third there was an extensive non-suppurative cellulitis of the neck; the antrum was opened at the depth of more than half an inch, but no pus found. The patient was relieved within a few days, and made an excellent recovery both from the ear and from the neck.

GENERAL REMARKS.—Diseases of the mastoid afford most interesting studies of all forms of inflammation of bone, but some of the varieties which I have made in the foregoing classification offer very much greater difficulties in diagnosis and treatment than others.

¹ Unknown whether acute or chronic. 1.

² One case, which is classified under both *c* and *d*.

Class I., 13 per cent. of all the cases, raises the question of the advisability of the operation where there are absolutely no symptoms pointing to an extension of the inflammation, and I believe that in this class particularly it is possible to greatly extend the usefulness of the operation for the relief of suffering, reduction of the inflammation of both the mastoid and the tympanum, and for diminishing the risks of dangerous and fatal complications. In all the cases, with the exception of the one fatal, and which showed meningitis at the time of operation, the relief was most marked, and, as I believe, the inflammation shortened very much. The fact that in twelve of the fourteen cases pus was found within the bone fully justifies the operation on general surgical principles. The unusual proportion of cases of sclerosis, eight of the fourteen, suggests that this condition helps to explain why there was no extension of the inflammation.

Class II. embraces 69 per cent. of all the cases. In variety (a) very much the same questions arise as in Class I., except that the subperiosteal pus is proof positive of the existence of inflammation. But shall we go further than the evacuation of the post-aural process? I grant that in many acute cases the simple evacuation of the subperiosteal abscess is sufficient for a slow cure of the mastoid and tympanic disease, but I have so often seen the external abscess followed later by a carious perforation of the bone that I am satisfied in the majority of these cases in adults it is better practice to open the interior cavities at the time of the first operation. In all of the cases in which I have done so I have found pus, and the ultimate result has justified the procedure. The opening of the cells, in addition to the evacuation of the subperiosteal abscess does not, in my opinion, increase the risks, but rather will hasten the cure of the whole inflamed tract, and prevent in many cases dangerous complications, or a second operation. The only theoretical objection is the violence done to the bone; but the bone is already inflamed, and in many cases will be perforated ultimately by the disease. Furthermore, the bone is, in my experience, thin in these cases, and the very existence of the subperiosteal abscess from extension of the mastoid inflammation outward seems to imply a thin cortex—at least, I cannot recall one of these cases in which I have found sclerosis.

Very acute cases of this variety in young, healthy children do so well, however, after emptying the subperiosteal abscess, that in them I regard the opening of the bone itself as less distinctly indicated than in other cases.

The simplest cases are, of course, those in Class II. (b), where the inflammation extends outward, producing a carious fistula, which serves as a guide to the surgeon in entering the cavities. This variety includes the majority of cases, 44 out of 93, or 47 per cent. Such a carious fistula does not, however, imply a great amount of inflammation of the external

soft parts, or any collection of pus beneath the periosteum. In a number of cases an exposure of the bone has demonstrated such a fistula where œdema and swelling of the overlying tissues were absolutely wanting. In other cases swelling and œdema were very circumscribed and intermittent, appearing for one or two days, then disappearing entirely for several days or longer, to again return for a short time, and then again disappear. This intermittent œdema and swelling is a marked characteristic of some cases of carious perforation of the external cortex, and I believe I have never operated on such a case without finding the perforation. This class, II. (*b*), is the only single variety which affords a large number of cases; all the others are scattered in small numbers under the different headings.

In varieties (*c*) and (*d*) there can be no question, I think, of the advisability of the operation to get at and treat surgically the disease of the bone.

Class III., 20 per cent. of all the cases, I have regarded heretofore as the most serious of all varieties, except the extensions into the cranium. The extensive burrowing of pus downward and backward, beneath the deeper cervical fascia, even to penetration of the pleura or caries of the vertebra, was by no means an uncommon history formerly, before the natural history of mastoiditis was understood. In view of my own experience and that of others, years ago, the present statistics are very gratifying, showing thirteen cases of this class, with twelve recoveries, and one unfinished, but now nearly well. None of these, however, were of the severest type, which we formerly used to see, and all were operated upon before the inflammation had extended far in the neck, and the further extension of the inflammation was checked.

Varieties (*a*) and (*b*) correspond exactly with the same varieties in Class II., except that the base of the mastoid is the seat of disease instead of the external cortex, and there is apt to be a collection of pus, usually small in amount, beneath the periosteum of the base, in or near the digastric fossa.

Variety (*c*) is an extension of inflammation to the tissues of the neck for a greater or less distance.

All cases of this class offer difficulties in the method of operating. There is very free bleeding from the inflamed tissues, and the pus, if small in amount, as is usual, may lie wholly beneath the periosteum, behind the tip of the mastoid. It is my practice to reach it by exposing the external cortex, then with a director bent to an appropriate curve to go round beneath the periosteum, usually behind the edge of the mastoid, but occasionally in front, and thus evacuate the pus and examine the base of the bone. If this is carious I remove all softened bone, extending my original incision by such a cross-cut as will allow me to insert a straight drainage-tube upward into the cavity. By this means

fair, but only fair, drainage is established. It is impossible to break down the partitions of the cells, and thoroughly cleanse the mastoid cavity. On these accounts I believe it better to follow with an opening of the external cortex, where, in most cases, more pus will be found. We thus obtain an opening and counter-opening, by means of which thorough cleanliness can be maintained. When inflammation of the neck is already developed a further opening may be required two or three inches below the bone, and I have inserted a drainage-seton through the external cortex, down through the bone into the digastric fossa, and brought it out four inches below the tip of the mastoid, with the result of a rapid cure of the mastoiditis and cellulitis of the neck.

Class IV. includes but 6 per cent. of the whole number of cases. In variety (a) there was pus beneath the periosteum of the anterior face of the mastoid, but no perforation of the cortex anywhere; the external cortex was then opened and pus found in the diploë. In variety (b) there was a distinct carious perforation of the anterior wall of the mastoid, which was enlarged externally till a drainage-tube could be inserted into the antrum. This class furnishes a much greater percentage of deaths than any of the other classes, 3 deaths out of 5 cases, while all the other classes together gave but 4 deaths in 74 cases. Why this should be so is not clear.

DIAGNOSIS OF INFLAMMATION OF THE MASTOID.—The symptoms I have relied upon are, first, the history of an existing or preceding tympanic inflammation, in the majority of cases attended by an otorrhœa, but not always, for the discharge may be so slight as to escape observation, or, in exceptional cases, there is no rupture of the drum-membrane and consequently no discharge. Again, the tympanic inflammation may have wholly subsided and the inflammation of the mastoid developed weeks afterward. Of such instances I have seen quite a number.

Of the subjective symptoms, pain in the mastoid and over the side of the head are very common. Objectively, sensitiveness of the bone on pressure I regard as the most important single symptom. This sensitiveness must be looked for carefully; it is often only developed on deep pressure of the bone, and may be very limited in extent and on any part of the mastoid, although most frequently found over the antrum. Exceptionally it is wholly wanting, and the other symptoms have to be relied upon for the diagnosis. Œdema of the upper posterior wall of the meatus close to the drum-membrane, when it exists, is an almost certain indication of mastoid inflammation; it is characteristic of inflammation of the antrum, however, and where the inflammation is chiefly in the lower portion of the mastoid cavities it may be wholly wanting, and consequently its absence does not preclude mastoid disease.

Œdema of the external tissues is the most common indication that pus is forming beneath the periosteum, but this is by no means always

the case. It may exist without pus, may continue for a long time without pus, and even subside without any suppuration under the periosteum or any external caries of the bone. It is an indication of extension of the inflammation only to the overlying tissues, and we may have it from simple otitis.

Of the 12 cases in which osteo-sclerosis was found, œdema of the skin over the mastoid was present in 5, and in 2 of these no pus was found either in the diploë or in the cells. Subperiosteal pus may exist without œdema over it, and caries even without any external manifestations.

Fluctuation I find a very uncertain symptom; the pus is so confined and the tissues over it often so swollen that it cannot be detected, and again, the œdema is not infrequently so great that it gives a sense of fluctuation by which the most expert may be deceived.

Another very important symptom of mastoid inflammation is the continuance of a tympanic suppuration in spite of thorough and persistent cleansing and rational treatment, when no other cause for the chronicity can be discovered, such as granulations or tympanic caries.

The pulse and temperature are, of course, a valuable assistance in many cases; this is especially true of the very acute forms attended with rapid and profuse suppuration, but in the less acute varieties and just in the cases where there is the most doubt in diagnosis they are often of no value whatever, remaining normal throughout the disease.

A diagnosis of the exact condition previous to operation I find impossible in a large proportion of cases. One can speak quite positively of the existence of inflammation, but whether the operation will develop a subperiosteal abscess, caries of the cortex or interior, an otitis without suppuration, or a suppurative osteo-myelitis, is often uncertain. The operation is equally indicated and beneficial in either condition. I find it also impossible to predict beforehand the anatomical condition of the mastoid, whether pneumatic, diploëtic, or sclerosed; a large well-developed bone is more likely to be pneumatic than a small one. I have supposed that the duration of inflammation helped afford a clue to the condition, sclerosis being more probable in a chronic case than in an acute one. These statistics seem to support this view, as I find that in 40 per cent. of my cases of osteo-sclerosis the mastoid symptoms were chronic, while of the whole number of cases but 24 per cent. were chronic. I have found sclerosis of the bone not at all infrequent in dissections, but whether we are justified in asserting that this is always the result of inflammation I do not feel sure. In operating it is certainly met with quite often in very acute cases, where we cannot get a history of any previous inflammation.

The amount of pus found in the interior of the bone varies very much in the different varieties of the disease; it is really abundant only in

cases of suppuration of the mucous membrane. In osteo-myelitis it is found only in the minutest quantities, and sometimes not at all; with caries and necrosis it is often so small in amount that it can easily escape notice in the free bleeding which takes place from the granulations.

METHOD OF OPERATING.—I have tried all the different methods, beginning with the small trephine, then various forms of boring instruments, reamers, chisels, and gouges, and the dental engine, but for the last three years have used the gouge and mallet for opening the bone, and the dental engine afterward to enlarge the opening, to remove irregularities of the bone on the interior, but more especially to clear off a carious surface on the interior, for which it is especially adapted by its rapid cutting and by the delicacy with which it can be manipulated. I have never seen any ill-effects from the engine, but I am always careful to use it for only a very short time on account of the heating, and never with drills but with burrs. Its use does away with much hammering and the resultant shock to the brain.

Unless nature has furnished a guide in the shape of a carious perforation which, when enlarged, will give sufficient drainage, I endeavor to open the antrum, following the rules laid down by Schwartze. A communication with the tympanum, as shown by the passage of fluid from the wound into the meatus or Eustachian tube, is, in my experience, rather the exception than the rule, but this fact was not carefully enough noted for me to speak of the actual proportion of cases in which it occurred. Although I am very glad to have it, I am satisfied in a large proportion of cases it is not necessary for the most perfect and rapid cure.

I have met with but one accident in the operation, in a case operated upon since these statistics were compiled. In a man I had perforated about half an inch through a sclerosed bone and was examining the depth of the wound with a blunt director, when it broke through a thin layer of bone, and this was immediately followed by a most profuse venous hæmorrhage, which I at first thought must come from the lateral sinus. Examination with a probe, however, detected bone in every direction in the opened cavity, and I think it was a case of enlarged diploëtic veins, which are spoken of by Schwartze as sometimes existing. The bleeding was so profuse that any further operation was impossible, the wound was packed with iodoform gauze, a pressure-bandage applied, and the patient is making a good recovery.

I have long since given up metallic drainage-tubes, and use only rubber. General antiseptic precautions are used, with abundant irrigation of corrosive sublimate 1:3000. The ear is dressed daily and irrigated with corrosive 1:3000 for several days, and then with 1:5000; generally within a few days all odor disappears, and when the discharge diminishes the dressing is made only every second day, rarely at longer intervals, on account of the risk of infection from the

inside. To stimulate granulations in bare bone I use iodoform, either in powder or ethereal solution.

Several times I have exposed the dura mater and lateral sinus in the removal of sequestra, but without any injurious effect.

The good effects of the operation are usually seen within two or three days, and often immediately in relief to the pain, and there is generally a rapid improvement in the tympanic condition, but the chief object, of course, is the prevention of extensive destruction and the fatal complications which are well known to often supervene.

SELF-PURIFICATION OF FLOWING WATER,

AND THE INFLUENCE OF POLLUTED WATER IN THE CAUSATION OF DISEASE.¹

(A BIOLOGICAL STUDY.)

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OUR watersheds being in great part composed of diluvial and alluvial formation, can, besides holding much in the depression of their uneven surfaces, take up and retain a varying amount of the water precipitated from the clouds, or coming directly from condensation of atmospheric vapor or otherwise reaching the earth. It may be considered that dry, sandy soil takes up forty-five per cent. of its volume of water;² while dried turf can absorb perhaps ten times its weight of water by reason of the great surface created by the enormous number of minute particles. The finely-divided elements of the soil can furthermore, by their capillarity, cause water to rise through their substance to a considerable height, which in loam is many times greater (though the rise is there much slower) than in the coarsest earth (gravel). The hydrostatic power of earth is much augmented by the presence in it of organic matter;³ and the cleaner the ground is kept the drier it is.

More or less deep in permeable earth, underlain with impermeable strata, water is regularly found completely filling all the pores, and this is called the "ground-water." Not to explain at length the zonal differences of the layer of earth between the surface of the ground and the surface of the ground-water, it may briefly be said that water passes rapidly through this when of coarse gravel, while in very fine soils many months may in our region be required for a given water to make

¹ Read before the American Society of Civil Engineers, Nov. 5, 1890, and before the New York Academy of Medicine, Nov. 7, 1890.

² Meister: *Soyka, Der Boden*, page 83.

³ Hoffmann: *Archiv für Hygiene*, ii. 143.

its way from the air down to the surface of the ground-water. By taking up certain constituents and losing others it may have considerably changed its character in the downward passage.

Most varieties of the microorganisms which swarm on and near the surface of the ground are less able to find the conditions favorable to their life and activity after descending a few feet. Some porous soils seem to be permeable to bacteria for less than six feet. Hence the ground-water is often quite free from bacteria. The best deep springs show few or none of these, and the uncontaminated water flowing directly thence is, unless highly impregnated with minerals, the most wholesome of beverages.

These underground bodies of water may be regarded as subterranean lakes or water-courses, usually flowing several feet daily toward the streams or lakes draining the basins in which they are, and the level of the ground-water is lowest near such draining-streams or bodies of water. Hess¹ found that in northern Germany these underground masses of water could move sometimes more than one hundred feet per day. Thiem² judged from observations on the Bavarian plateau that from nine to twenty-five feet was an accurate estimate of the daily advance of the ground-water there measured.

It is largely by reason of such enormous and well-protected reserves that the lakes and streams of our region maintain the average level to which they tend to return when temporarily lowered by drought or when swollen by freshets.

For about thirty-five years, since first v. Buhl and Seidel called attention to the principle, v. Pettenkofer and others have insisted upon what they consider the causal relations existing between the moisture-changes indicated by the varying height of the ground-water level, and the prevalence of epidemics, which, they claim, are not much, if at all, influenced by purity of drinking-water as such, by mere filth, or any other than this particular element, which induces the manifestations of activity on the part of the causative germ. Soyka's experiments³ led him to consider that in a long, dry spell of weather, such as precedes the lowering of the ground-water level, there is a more or less uninterrupted capillary flow toward the surface. With this, living microorganisms that may be in the ground are carried upward into the outer layers of the soil. From the evaporation of this water the microbes remain on the surface or somewhat deeper. With rain they may be washed along or return into the ground. If dry weather persist they may be stirred up with the dust and in their exsiccated state carried far

¹ Zeitschrift des Architekten und Ingenieur-vereins in Hanover, xvi.

² Journal für Gasbeleuchtung und Wasserversorgung, 1880.

³ Prager med. Wochenschrift, 1885.

through the air, as has been rendered evident by repeated examinations where they have been found many miles out above the open ocean. After the evaporation of water coming up to the surface the previously-dissolved substances remain in the upper layers of the ground, and the water there becomes a more concentrated solution of these substances. The ground-water is in itself quite harmless. Its significance is as an indicator of the fluctuation in the moisture of the ground, and the cleaner the earth is kept the less importance is attached to hydrometric changes.¹ While it is not denied that germs may have to be present to cause the disease, this doctrine claims that they can produce disease only when the local conditions favor their activity.²

Repeated and careful observations have made those of the Munich school who contend for this "localistic" theory insist that, excepting of course where by artificial drainage we intentionally cause water to be drawn away from the ground, such a disease as, for instance, typhoid fever, increases as the ground-water sinks, and no considerable epidemic of typhoid occurs without at the same time a sinking of the ground-water level. No considerable typhoid epidemic occurs in the period of a large rise of the ground-water, say the champions of the interpretations which v. Pettenkofer has given of the facts as observed at Munich.³

The majority of practical hygienists do not endorse these views in their fulness. The definite advances made of late years by biological study have given further and further ground for believing that, among others, such diseases as typhoid and probably cholera are solely caused by the vital activity (within the human organism) of the specific bacteria of these diseases. Inasmuch as a great number of sporadic and epidemic attacks of these scourges have been clearly traced to the consumption of water containing the infective elements of these diseases, and no other factor has there been constant or frequent, this belief is referred to as the "drinking-water theory." While emphasizing the baneful effect of polluted drinking-water, it is of course admitted that unclean ingesta or anything that introduces these living bacteria into the alimentary canal may be the means of carrying the infection into the system.

In the case of cholera the localistic theory seems more difficult to refute than in the case of typhoid. Yet in India, as elsewhere at the time of each epidemic, much circumstantial evidence has accumulated to make us suspect that the presence of the infective element in the alimentary canal is the prime factor in inducing the disease. Bacteriology has

¹ Dr. Max v. Pettenkofer: *Deutsche med. Wochenschrift*, Nov. 28, 1889, p. 977.

² Dr. Max v. Pettenkofer: *Archiv für Hygiene*, iv. 249; v. 353.

³ Prof. J. Soyka: *Archiv für Hygiene*, vi. 257. This is not wholly in consonance with the facts of some epidemics.

strengthened this opinion from the time when Koch¹ found the peculiar spirillum in cholera dejecta and in the intestines of those who had died from cholera. Its presence in the water of a certain tank was demonstrated by him together with the fact that in the neighborhood in question only those who had drunk of this water had the disease. The facts were presented with Koch's unsurpassed precision and carried more conviction than any single one of the various similar histories. Still, no theory suffices to explain the exemption of certain cities (as, *e. g.*, Stuttgart, Salsburg, Innsbruck, Hanover, Versailles, Lyons, and others) from any outbreak during the various epidemics. These important centres of travel and commercial intercourse did not succeed in barring all entrance of infection from without.

Among those who consider that intelligent admission of ignorance is preferable to subserviency to a theory, it is proper here (because of his great and favorable opportunities for many years of observing cholera in its endemic haunts) to mention the statements of Surgeon-General Cunningham.² He observed that some districts in India are wholly immune at all times regardless of the contaminated state of the water supplies. In his experience, disinfection of cholera dejecta is useless, and drinking-water does not cause cholera. Unlike some who have never been near India, or have not remained there for many weeks, he considers that railways have not in any way influenced the spread of epidemics of cholera in India either in time, place, or extent. It is needless to say that others dispute the accuracy of these inferences, and there is much evidence on both sides.

Selecting, then, the best portions from these theories, we find that both condemn a drinking-water having many³ and various bacteria, and both call for abundant supplies of good water for individual and public uses. At the last International Congress, in Vienna, in 1887, where the leading hygienists of the world were gathered—and among them the high priests and acolytes of the ground-water theory—there was a unanimous and unmistakable expression of the opinion that, in order to the maintenance of a high degree of health, cities need an abundant supply of the purest water attainable by them.

The green algæ and the diatomaceæ are found only in waters well supplied with light and air, with no excess of organic matters, and free from regular sources of infection. But the written and oral expression of the opinions of others familiar with the subject, as well as an extensive personal observation, leads me to believe that a water containing a large number of bacteria, especially if many varieties are detectable in it, is undesirable as a beverage so long as it has not undergone the ster-

¹ Bericht über die Thätigkeit der zur Erforschung der Cholera im Jahre 1883, Entsandten Commission, page 182. Berlin, 1887. On page 211 of this report is given an impressive diagram showing the permanently decreased cholera mortality in Calcutta since Nov. 1, 1869, from which time the city has been supplied with hydrant water of much purer quality than the tank and river water previously used.

² Cholera: What Can the State Do to Prevent It? By J. M. Cunningham, M.D., etc. Calcutta, 1884.

³ This is admitted even in Emmerich und Trillich's book, München, 1889, page 168.

ilizing influence of heat. No sufficiently prolonged and repeated clinical observations by medically-qualified workers have yet accumulated to determine just what harm, if any, the ordinary earth- and water-bacteria can produce when extensively consumed by human beings. Most of these microorganisms are classed as harmless.

Unlike pathologists in some other countries, we do not here so often detect the ova of tænia and other intestinal parasites as having come from the ordinary water-supply;¹ and although we here, of course, recognize that some hæmatodes develop first in water, and are thence carried to man, we are not confronted with such unpleasant statistics as Sievers derived from his obductions in Kiel.²

From the time when Dr. Michel³ first called attention to the influence of contaminated water in causing typhoid fever (1855), and Snow in 1848 said that cholera was due to the use of infected water, an enormous mass of evidence has been constantly accumulating and has caused nearly all physicians among us to believe that such influence has usually been operative in those cases they have met with, even if for various reasons the exact source of the infection could not be traced. Furthermore, numerous attacks of diarrhœal disorders have been explainable in no other way.

Endorsing Nægele, the botanist, and other partisans of the extreme ground-water theory, Emmerich⁴ performed a series of experiments upon animals, and, therefrom, inferred that decomposing organic matter taken with water into the stomach could not cause harmful symptoms. As evidence of his sincerity, he daily, for two weeks, drank from one to two pints of very foul water taken from a hospital brook, which to the naked eye and to chemical tests was distinctly infected with sewage, and which showed a large amount of chlorides, ammonia, and various organic substances. During the first three days he noticed slight gastritis, yet during the remainder of the fortnight no ill-effects were recognized. A month later, having acquired a gastro-enteritis, he again tested upon himself in the same way the effect of the same sort of water, but observed no detriment to his health.

Very few could be induced to repeat such unpleasant subjective experiments, and many such would only prove that polluted waters vary in character and are not at all times, and under all circumstances, demonstrably harmful. Most persons would, if solely for æsthetic reasons, strongly object to drinking freshly-polluted waters.

The experiments of Prof. J. v. Fodor⁵ show that, unless sterilized, as by boiling, foul waters may be assumed to be dangerous, even if not obviously so; for they tend to cause some degree of putrid infection, which, however vague, may like extreme hunger⁶ and other "cachexies," act to weaken the system and render it less resistant to general or special infection. Beside abundant laboratory evidence of this sort, the most

¹ Knuch: Virchow's Archiv, xxiv, 453.

² Sievers: Schmarotzerstatistik, Kiel, 1887.

³ See Annales d'Hygiène Publique, etc., Dec. 1859, page 541.

⁴ Zeitschrift für Biologie, xiv, 563.

⁵ Archiv für Hygiene, iii, 118.

⁶ Canali and B. Morpurgo, Fortschritte der Medicin, Sept. 15, and Oct. 1, 1890.

impressive of tests have unintentionally (but in general with apparently very serious results) been made by so many bodies of men and communities, that the mere enumeration would cover many pages. When more than one-tenth of a population are attacked by typhoid after drinking of the water from a presumably pure mountain stream, stored for consumption, but into which a small amount of typhoid dejecta had been introduced (to cite the familiar experience of Plymouth five years ago), the fact that the majority of those using the same water, perhaps uncooked, revealed no symptoms of the malady, does not invalidate our right to interpret these epidemics by the light of our present knowledge, and so infer that a polluted drinking-water may be very dangerous. If Vienna, paralleling London's well-known experiences with cholera and typhoid, averaged many times the number of deaths from typhoid when she supplied her people with the water of the swift, "blonde" Danube, than she has had since the hill-spring supply has been furnished, the fact is very significant. But here, too, v. Pettenkofer has come forward with his keen interpretation of the facts, and has tried to show that infected water had nothing to do with the causation of the disease.

There are a few authentic laboratory experiments¹ which go to show that, in ordinary water, disease-producing bacteria are at least in some cases more or less speedily destroyed by the hardier saprophytic varieties that abound in all supplies of doubtful quality. But since first Moers² found the bacillus of typhoid in water suspected of having caused the disease, the finding receiving Prof. Gaertner's confirmation when it was later questioned; and Michael³ likewise detected these under similar circumstances, and was endorsed by Prof. Johné, a considerable number of competent bacteriologists have in different countries reported similar results. Others have verified these facts by adequate laboratory trials. So we are to-day allowed to believe that the microörganisms which cause various diseases can, despite the antagonistic influence of ordinary bacteria and under conditions which we as yet do not clearly understand, live at times for at least several days in natural and artificial waters of varying degrees of purity and still retain enough of their specific vitality to induce more or less serious cases of disease. The terrestrial and other conditions influencing the activity of these presumable causes have not yet been established with sufficient accuracy.

¹ Arnould: *Revue d'Hygiène*, ix. 27. Freudenreich: *Annales de l'Institut Pasteur*, iii. 200. De Giaksa: *Zeitschrift für Hygiene*, vi. 102; *Annales de Micrographie*, 1890. Garré: *Correspondenzblatt der Schweizer Aerzte*, 1887. Karliński: *Archiv für Hygiene*, 1889, 113, 432; also 1890, page 464. Kraus: *Archiv für Hygiene*, 1887, 205. Zagari: *Giornale Internazionale delle Scienze Mediche*, ix.

² *Ergänzungshefte zum Centralblatt für allgemeine Gesundheitspflege*, ii. 2, 144 (in 1886).

³ *Fortschritte der Medicin*, iv. ii. 353 (in 1886).

Chemistry affords us no sufficient test of the freedom of a water from the infective principles which cause serious diseases or which lessen the sum-total of the vital forces and increase the susceptibility to infection. Yet, in lack of sufficient biological study of the question of self-purification of polluted sources of water-supply, the extensive and valuable reports of chemical examinations of numerous streams are very interesting and instructive.

Quite contradictory in their conclusions to almost all others, the eminent investigators engaged on the work done by the famous English Commission in the years following 1868, concluded that no river, even in a course of more than a hundred miles, became purified after pollution by organic matter. In all other countries the opinions are, and have generally been, that after flowing a number of miles from the place where sewage had entered, the river has chemically purified itself of at least a portion of the organic matters introduced. Thus the chemists connected with the investigation of the Seine waters found¹ that this river, after becoming very foul from receiving the sewage of Paris, purified itself in a flow of from one hundred and nine to one hundred and fifty kilometres, so that it had returned to the same chemical quality that it had before reaching Paris. Of the numerous German presentations of similar facts that of Hulwa² is, like the repeated examination of the Isar at and below Munich, still more convincing. Hulwa found that the Oder after receiving the sewage of Breslau had completely purified itself chemically in a flow of thirty-two kilometres (or less than twenty miles). In this country the determinations of the late Prof. Wm. R. Nichols³ made him conclude that various rivers of Massachusetts went through a similar process. Very interesting in this regard are Long's⁴ results, as he tested the changes in dilute sewage flowing from Chicago for miles down a canal. The element of considerable constant or irregular dilution is thus omitted till the Illinois River is reached. The oxidizing process causes the water to become much purer at Ottawa, after eighty miles of flow, and it is still purer at Peoria, one hundred and fifty miles from Chicago. The most notable improvement was with respect to free ammonia, and the process was decidedly more active in summer than in winter.

Stagnant water and that standing in vessels require much longer time than moving water to have a certain degree of reduction take place in the organic substances present. Most chemists have been led to attribute a very great influence in this respect to the numerous bacteria which are

¹ Vierteljahrsschrift für öff. Gesundheitspflege, ix. 434. Durand-Claye: Assainissement de la Seine, Paris, 1885.

² Ergänzungshefte zum Centralblatt für allg. Gesundheitspflege, i. 65.

³ Mass. State Board of Health Report, 1875.

⁴ American Chemical Journal, x. 26. London Chemical News, June 29, 1888.

found to be present in all sewage-contaminated waters. That the "nitrifying" varieties of these accomplish the work of oxygenation was first declared by A. Müller.¹ Emich² supported this theory by experiments in which he found that water purified itself chemically if many bacteria were present, but the same water sterilized by heating and kept germ-free did not improve chemically until, from exposure to the air, other bacteria had entered. Direct oxidization by the oxygen of the air did not take place, and the action of ozone and peroxide of hydrogen was less potent than that induced by bacterial activity. Heræus³ studied the question and found that bacteria differed greatly in their activity in this direction. He got no oxidation with any of the few river and earth varieties that he tested. In Europe and at Lawrence, Mass., recent tests have shown the importance of these theories.

Biological investigations into the self-purification of rivers have been very scanty and incomplete. Frank,⁴ Prausnitz,⁵ and Uffelmann,⁶ examining, respectively, the Spree, the Isar, and the Nebel, found that the number of bacteria present before the accession of the city sewage had increased with the addition of this polluting fluid. Within a dozen miles or so of the place of the sewage introduction, the water, even if biologically inferior, seemed usually not much worse than might have been the case if no city filth had contaminated the river. Schlatter⁷ has recently reported that the Limmat usually purified itself bacteriologically to a marked degree within nine miles after receiving the sewage of Zürich.

These and similarly executed observations are very important, even though the present methods of examination have not reached the degree of perfection (aimed at by Chantemesse, Holz, and others) that shall enable us to cultivate the morbidic germs present in a given example, by means of some perfect medium that at the same time suppresses any or all others, as we may elect. The commoner bacteria are in general hardier than the noxious ones, and, as in the laboratory, so in nature tend as a rule to destroy the harmful ones—or at any rate prevent their increase. Both kinds are exceedingly alike in many respects, and certain varieties of the harmless ones are very difficult for an expert to differentiate from well-known disease-producing varieties. Considering, therefore, the present status of practical bacteriology and its limitations, it seems a very fair test of the question whether rivers purify themselves from infection introduced, if we compare the numbers of germs found present

¹ König, Berlin, 1887, page 99.

² Monatshefte für Chemie, vi. 77-94. Chemisches Centralblatt, 1885, 333.

³ Zeitschrift für Hygiene, i. 193, 213.

⁴ Zeitschrift für Hygiene, iii. 355.

⁵ München, 1890.

⁶ Vierteljahrsschrift für öff. Gesundheitspflege, xxii. 377.

⁷ Zeitschrift für Hygiene, ix. i. 56

in the water taken at different points. We can then reason from the figures and facts thus afforded. Hence, I herewith present data from some of the analyses which I have at various times been able to make. All have been done according to Koch's gelatine method, and, what is most important, all the waters have (unless the contrary is mentioned) each been plated within a few minutes after taking the sample in the most careful manner from the body of water. This has been effected by means of a portable "cool chest," which allows the method to be successfully employed even amid the high heat of the "Great American Desert" in summer.

A swift, foaming mountain brook, that of the Kaaterskill "Clove," was tested at a part where it might have recently received the drainage of several hundred people, and where dilution seemed less conspicuously an obstacle to accuracy than would be expected in many parts of the brook's course. The ground was wet with rain which had fallen within twenty-four hours. Hence the element of dilution and possibly the entrance of new (surface) bacteria make the figures lack absolute value:

1890, September 11:	Bacteria in 1 c c.
Brook in Catskills (after chance of pollution)	54
Same brook 1½ miles further on (after 300 feet of irregular fall) . .	49

Cœur d'Alène Lake supplies the Spokane River, which is tributary to the Columbia River. Pend d'Oreille Lake is in similar wild country and its effluent stream enters the Columbia River in British America. The former lake I did not test, owing to the greater difficulty and delay involved in getting out from it—an element which might imperil the accuracy of the results. It probably has fewer bacteria than the lake given, and which answers here our purpose. The water was plated within five minutes of obtaining the sample fifty feet out in the lake, at a time shortly after a rainfall, and in a portion near a small lumber camp:

1890, June 10 (clear):	Bacteria in 1 c c.
River flowing into Pend d'Oreille Lake (rain on previous day) . .	154
Pend d'Oreille Lake, highest number found ¹	43
Spokane River, 4 miles above Spokane Falls	69
“ “ just below city and falls (Spokane)	129
“ “ one mile further down	125
Willamette River, 4 miles above Portland, Oregon	44
Columbia River, 37 miles below Portland, and 31 miles below confluence with Willamette River	52

The Mississippi affords in places excellent chances to study the question. The changes which are undergone by the pectose and other de-

¹ This number was above that of the average of Western lakes. Thus Union Lake, upon which Seattle verges, averaged in the middle of its surface (June, 1890) only 13 germs per c c. on three plates which I made of its waters.

composable elements of the vast quantities of logs and wood-refuse that the lumber industries cause to be present here do not seem to cause nearly so great an increase in the number of bacteria present as though the organic matter were wholly in the form of that coming from the surface-drainage of agricultural districts and many habitations. This I have observed in the Ottawa River of Canada, and in other parts of the North.

Above the St. Anthony Falls the Mississippi has already drained a fairly populous portion of its valley. After passing over the falls the water receives sewage, then falls rapidly for a short distance, and in the next ten miles does not appear to receive much other contamination. The time when the water was taken seemed very favorable for excluding any unusual degree of this, yet in view of the figures I am inclined to suspect some contamination not detected; but the fact that the sample from St. Paul stood unplated for an hour may explain the number found. Even a passenger-boat crossing up stream may at times cause a decided increase in the number of bacteria in some parts of the current. This I know to my cost, from having in that manner had a series of plates made at Sault Ste. Marie rendered unreliable for the purposes of this paper.

1890, June 8 (clear and sunny):		Bacteria in 1 c.c.
Mississippi River, above Minneapolis		620
“ “ just below Minneapolis		794
“ “ above St. Paul, 10 miles below former sample: no obvious source of pollution		843

(Last sample kept one hour before plating.)

But for its short flow, the Passaic River furnishes every feature that could be desired for the study of this question. The northernmost tributaries furnish pure water in most parts. Between the junction of the Pequannock and the Great Falls at Paterson (six or seven miles) its way is through a rocky valley receiving relatively little drainage. In that distance, and with the Great Falls, the descent is 100 feet. Before the partial obliteration of the Little Falls, recently accomplished for economic agricultural reasons, I endeavored there to determine the influence of the violent agitation upon the number of microorganisms in the stream before and after such action:

1889, February 13 (sunny and cold):		Bacteria in 1 c.c.
Lake Macopin, highest number found		57
Pequannock River (below a hamlet)		361
Passaic River, above Great Falls at Paterson (after draining 855 square miles)		573
“ “ below Great Falls in Paterson (near a mill)		1030 ±
“ “ “ railway bridge (after receiving sewage)		2172
Water from Newark hydrant (supplied from lower Passaic River)		4000 ±

1889, November 5 (cloudy and cool):

	Bacteria in 1 c.c.
Passaic River, half mile above Little Falls	372
" " ten feet from rocky bank, just above falls	720
" " " " " below "	704
" " middle of Lincoln's bridge (five miles down stream)	631
" " just above Great Falls	600 ±
" " " below " "	600 ±
" " Middle of railway bridge (after mingling of sewage)	1934
" " " " " above Passaic	1907

= Denotes partial liquefaction of plates such as to prevent absolutely precise determination.

After leaving the region of Port Jervis the Delaware gradually enlarges, but regularly receives comparatively little objectionable drainage till Easton is reached at the junction of the Lehigh. Here it has mingled with it the more or less recent and diluted refuse of probably more than one hundred thousand people. All the way down to Trenton over fifty miles further, the drainage is considerable and comes from a large area having many farms and numerous inhabitants. Thirty miles beyond Trenton, Philadelphia takes part of its water from this river after it has flowed from a water-shed supporting over half-a-million people.¹ My examination was made at a time when considerable rain had fallen in this valley during the previous three days, and the biological results must be numerically regarded as those of the river when at its worst. Various kinds of microorganisms were detected in the water, including numerous "earth" and putrefactive bacteria. Among these were "Proteus" forms which may be ranked among the objectionable varieties,² yet they are probably antagonistic to the germs of typhoid.³

The Trenton water, said to be from the hydrant, taken by me on the same day at the Pennsylvania Railway Station, had only a few hundred bacteria of five distinct harmless varieties. It was quite unlike the river-water in character.

1889, April 27 (rainy, river swollen):

	Bacteria in 1 c.c.
The usually excellent lake above Delaware Water Gap	1,230
Delaware River at Water Gap	3,400
" " above Easton	4,270
Lehigh " " "	4,925
" " and Delaware mingled four miles below Easton	10,000 ±
Delaware River at bridge near Trenton water intake	20,340

Collected by Philadelphia health officer, and carefully kept cool till plated by me after four hours or more:

Delaware River, Philadelphia pumping station	28,000 ±
Schuylkill at Roxborough	43,750 ±
" at Spring Garden	41,456 ±

¹ See Report of Engineers Hering and Ludlow, Phila. Water Department, 1885.

² Hanser: Ueber Fäulnisbakterien. Leipzig, 1885. Bordoni-Uffreduzzi: Zeitschrift für Hygiene, iii. 333.

³ Karlinski: Archiv für Hygiene, 1890, 473.

Under these unfavorable conditions, rivers, even in a sparsely-settled region where there is little or no farming, may be expected to show an increase in the number of bacteria as the samples are taken further and further down the stream. This I have observed in several of the rivers of this State and elsewhere in the East as well as in the Yellowstone Valley this summer on the occasion of a rainfall. Then the river at Glendive had more living germs in each cubic centimetre than were found at Billings, which is over two hundred and fifty miles further up toward the National Park.

The causes of the large proportion of cases of typhoid in Philadelphia cannot be traced to any single source of infection. The water-supply—if indeed here the chief cause—may have received the dangerous germs at any place between the *pumping-stations* (in sewage-polluted tidal waters) and more or less remote tributaries. It is very difficult to prove that contagion can be carried many miles down a river and many deny the possibility of this occurring. Owing to the use of contaminated milk by a number of families in Port Jervis, on the upper Delaware, a town of less than ten thousand inhabitants, the place had a slight epidemic of typhoid fever from October 1, 1883, till the end of the year. No increase in the number of deaths from that disease in Philadelphia was recorded until January, 1884, when the total amounted to almost double the average for the same month during the preceding five years. From these facts one should not infer that the increase of the disease in Philadelphia was caused by the bacteria which had survived the hundred-mile passage down the river, especially as in Trenton (which also takes water from the Delaware) there was, as I learn through the kindness of Dr. Ezra M. Hunt, no increase of this disease noted at the time. Still it seems highly probable that the health of the city would be improved if all its water used for domestic purposes came from a remote location on this fine river and were then conducted for many miles through an aqueduct. The deeper such aqueduct and its reservoir the cooler would the water be in summer; and the more moderately cool pure water is, the more wholesome it is for the masses of a city's population.

From the above-given observations it can be inferred that, under the most favorable conditions, river water tends to a certain degree to purify itself of infective and other bacteria introduced. So long as fresh contaminations are constantly entering, this purificative tendency is virtually inoperative. The liability to error, owing to unrecognized (not easily appreciable) contamination of the waters, lessens the value of any tests made with our rivers. Hence, for the purpose of definitively resolving a portion at least of the problem, I have had recourse to a series of biological analyses of the Croton water in different parts of its flow through the magnificent aqueduct which for nearly half a century has so well served this city.¹ By reason of its superficial passage and of the configuration of the country, the old Croton aqueduct follows a more devious course than the new one, which is not yet in complete working order. Therefore, and because of the thorough aërication, the old aqueduct (although dark throughout) is (for our purpose) much like an

¹ I wish to indicate my appreciation of the courtesy of the Chief Engineer and his assistants.

ideal stream, and is admirably adapted for testing the question at issue. The samples were collected at such intervals as corresponded with the flow of the current, which averaged a rate of a little more than two and a half miles an hour. Plates were prepared from the water as soon as it had been taken out by means of the usual sterilized bottles.

Bacteria per cubic centimetre.

Water of Old Croton Aqueduct.	Miles from Central Park.	Dec. 25,	Feb. 27,	April 3,	Sep. 30,	Oct. 11,
		1889, clear.	1890, clear.	1890, drizzly.	1890, clear.	1890, some hours after rain.
Temperature of water.		39° F.	37° F.	40° F.	60° F.	58° F.
Sleepy Hollow, Tarrytown	27	...	...	420	372	
Dobb's Ferry	22	...	453			
Yonkers	17	...	283			
Van Cortlandt	12	...	292	...	207	405
Broux inflow, adding $\frac{1}{2}$ or less to volume of stream . . . . .	...	...	[227]			
High Bridge	6	347	266	413	240	377
Central Park inlet to reservoir	0	285	175	407	199	302
West side, hydrant . . . . .	...	229	137	394	215	248
New aqueduct (slight temporary flow) . . . . .	...	...	...	...	183	
Surface of reservoir . . . . .	...	...	...	...	72	143
1 foot from bottom of reservoir [35 ft. deep] . . . . .	...	...	...	...	487 =	¹
3½ feet " " " " . . . . .	...	...	...	...	368 =	¹

These results must be interpreted as indicating that, under the best sanitary conditions, the number of germs of bacteria present in a flowing water usually tends to become less after a course of a few miles, provided that no new ones introduced have taken the place of those that have lost their vitality. So, the question arises, How is this decrease produced? As factors possibly acting to bring about this result we may consider—dilution, sedimentation (subsidence), concussion, chemical influences (including oxidation), light, heat, or cold, and the previously mentioned and admitted antagonistic action of other microorganisms.

Dilution of the water in which they are living does not kill bacteria; and the fewer existing in a given water the longer can any harmful ones present probably resist the antagonistic activity of the others. Dilution by a better water lessens, of course, the number previously existing in a given volume. Inasmuch as the little that is known on the subject leads us to infer that, of disease-producing kinds, a considerable number of individual bacteria must reach the vulnerable part of the invaded animal organism before they affect the health if they do so at all, we may believe that a lessening of the number of harmful bacteria by means of dilution renders water less unfit for drinking, yet does not make it absolutely wholesome, even though causing it to appear rela-

¹ Hyetophore worked defectively.

tively so. In the Niagara River, for instance, this element is very important. Although there I have several times been thwarted by rains and by other causes when starting out to analyze the waters, I have, through the kindness of Dr. Bergtold, received a series of samples which showed that the sewage-water of Buffalo became biologically as well as chemically much purer at Tonawanda, eleven miles lower down toward the cataract. There, as in most rivers; the purification is in great part effected by dilution. In the river water above the falls I found very many hundred bacteria after a rainfall, which there, as in other places can, by surface-washing bring noxious elements to a water.¹

From various experiments² it is known that particles settling in water carry down a notable proportion of the bacteria present. The chemical agents which are at times employed, by uniting with the organic matter present, effect much more than the merely mechanically-acting, weighty particles. Like several other investigators, I have at times during the last two years endeavored to determine whether in vessels of clear water from ten to twenty inches deep (also twice in tanks ten feet deep) bacteria settled to the bottom. The results have been neither uniform nor decisive, yet they seemed to manifest in general a slight tendency to subsidence. In laboratory tests the problem is rendered complex by the jarring of the building, the amount of air and light present, the variations of temperature, and other artificial influences unlike those operative in large bodies of water. The few observations made to test lakes, as by Fol and Dunant at Geneva Lake, Cramer at Zurich Lake, and Prausnitz at Starnberger Lake, do not indicate any great degree of subsidence. Of large bodies of water I have found:

1890, August 28:		Bacteria in 1 c c.
Saratoga Lake, central part, surface	.	56
" " " " 13 feet down	.	54
" " 1 foot above bottom, 32 feet deep	.	163

The few tests here given of the water in the Central Park reservoir permit the inference that there is some subsidence of bacteria there. Not to consider the larger number found at the bottom (as in only one instance did the apparatus work perfectly), there were fewer on the surface of the middle of this large body of water than entered through the aqueduct.

Very interesting in this regard are the results attained by G. Frank,³ who found that the hundreds of thousands of bacteria regularly detected

¹ Fluegge (Hygiene, 1889, 193) states that *bacillus Typhoid.* has been isolated from earth of a field with which typhoid dejecta had "not long before" been mixed. We know that this bacillus can, under certain circumstances, live for many weeks in dejecta.

² Kruger: Zeitschrift für Hygiene, vii. 109.

³ Zeitschrift für Hygiene, iii. 355.

in the Spree River water after it had received the sewage of Berlin, continued undiminished till after this foul water had passed into the Havel—a river that then for some miles flowed sluggishly through a series of broad expansions. After a course there of not much over eight miles, it was usually found that the water taken lower down (from Sacrow) had only a few thousand germs. As this diminution was, for chemical reasons, not to be explained by assuming an inflow of ground-water, it could be attributed to nothing but a subsidence of the microorganisms in the lake-like widenings of the slow river, perhaps influenced by the abundant organic particles present. The government health office,¹ testing similarly the city sewage poured over a large area at the experimental station, found a marked diminution of the bacteria present. There many settled in the still water before it flowed over into the Rummelsburg Lake.

Concussion and movement of the water I have not found to cause any considerable and immediate lessening of the number of bacteria, even in waterfalls² or where powerful pumps force it under great pressure. That harmful bacteria present can, notwithstanding vigorous concussion, produce fatal infection is obvious from the causation of an outbreak of Asiatic cholera at Southampton, in 1866, resulting in 107 deaths. It was traced by Parkes to the dispersion of infected sewage through the air by the unusual method of the bursting of many bubbles after the fluid had been churned up by powerful pumping and in a frothy condition driven along an open channel.³

That sunlight, as also diffused light, exercises an inhibitory influence upon the vitality of microorganisms has been a somewhat prevalent belief since the first report of Downes and Blunt,⁴ which incited Tyndall⁵ and various following investigators. Raun⁶ gives a list of many of these. A few, like Engelmann,⁷ state their views that this influence does not arrest microbial growth and movement. The majority, like Janowski,⁸ consider that light, even in a diffused form, restricts the development and activity of bacteria. In deep water this factor is of little or no consequence.

The even temperatures maintained in great bodies of water during the warmer portions of the year are favorable to bacterial life. The combination of moisture and great warmth, as in the delta of the Ganges,

¹ Jurisch, Berlin, 1890, page 79.

² Schmeleek (*Centralbl. f. Bakt. und Paras.*, July, 1890, page 102), testing Scandinavian waters, found many bacteria in the ice formed from the spray of a waterfall. Here oxygenation, cold, light, and the effects of concussion had all been operative.

³ Frankland: *Proceedings of the Royal Society of London*, xxv, 512.

⁴ *Ibid.*, xxvi.

⁵ *Ibid.*, xxviii.

⁶ *Zeitschrift für Hygiene*, vi, 313.

⁷ *Pflüger's Archiv*, Bd. xlii.

⁸ *Centralblatt für Bakteriologie und Parasitenkunde*, August 1, 1890.

is considered a potent factor in maintaining the germs of cholera so constantly vigorous that there the disease is always endemic. Cold does not destroy all bacteria, although a certain number succumb to extreme cold. Congelation of the water in which they are living seems relatively favorable to a portion of the pernicious microbes present.¹ In many serious epidemics it has been observed that in ice and snow the infection of typhoid was kept active for months.

Some chemical waste from manufacturing establishments has a destructive effect upon these low organisms; but such vague and irregular means can itself only be called a pollution of the streams, and is highly undesirable. The typhoid epidemic of 1889 at Wilkes-barre, Pa., caused it to appear that the bacilli of that disease were probably unaffected by the commingling of coal-mine water (containing free sulphuric acid and ferric sulphate) with the Susquehanna River water before this was taken by the water-works of the city.² When intelligently employed in suitable proportions, chemicals render foul water much purer. As a conspicuous instance of this I need only mention the city arrangements at Wiesbaden, by which the sewage is treated with quick-lime. It thus becomes odorless fertilizer and clear water flowing toward the Rhine. Dr. A. Pfeiffer,³ unlike Fränkel and others, asserts that, even after this thorough treatment of the sewage, from one-fourth to one-third of the bacterial germs remain alive in the water! If this be so, no acids or bases present in ordinary water are of any disinfectant value. Certainly the small amount of carbonic acid found in streams can devitalize no bacteria. Hochstetter⁴ and Fränkel⁵ found that by the action of this agent only a few varieties were markedly affected, and that nearly all the harmful ones could live in carbonated waters for days. My own observations have been to the same effect.⁶

The presence of a small quantity of mineral salts, as in the various mineral waters, has no notable influence upon the number of bacteria present. In all kinds of bottled waters from all parts of the globe living bacteria may be found, unless these waters have passed through a sterilizing process. Of the numerous waters flowing from the well-known springs in the Saratoga Valley, I have found that some were wholly sterile, while neighboring ones of like saline ingredients had hundreds of living bacteria in each cubic centimetre, the determinations being made immediately after the water to be tested had issued from the ground.

¹ Prudden: *Med. Record*, March 26, 1887. Bordoni-Uffreduzzi: *Centralbl. f. Bakt.*, 1887. Fränkel: *Zeitschr. f. Hygiene*, i. 2, 302.

² Breneman: *Journ. of the Amer. Chem. Society*, xii. No. 1.

³ *Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege*, xx. 55.

⁴ *Arbeiten aus dem königlichen Gesundheitsamte*, Band ii.

⁵ *Zeitschrift für Hygiene*, v. 333.

⁶ *New York Medical Record*, xxvii. 680.

Oxygen is everywhere present in the atmosphere in such abundance that, even in city streets, its proportion does not fluctuate more than $\frac{1}{2}$ of 1 per cent. from the normal 78.3 per cent. contained in the purest air. Of this atmospheric air, somewhat less than 2 per cent. of the volume of a mass of water is taken by the water. This fact is the foundation for a satisfactory explanation of a great part of the actual lessening of the number of bacteria in a flowing stream. They may be assumed to perish in the active exercise of their function of causing the organic matters to oxidize. When this impurity is in the form of the organic matter occurring in sewage, the process of reduction is a much more active one than with the *humic* substances found more prominent in purer river waters. It can hardly be claimed that ozone is ever present in these waters in sufficient quantity¹ to act as a disinfectant. The same may be said of peroxide of hydrogen, which, in the laboratory, as we may believe from the experiments of Althöfer² and others, destroys *B. typhoid.* and all other bacteria exposed for twenty-four hours to a 1 : 1000 solution of this in water.

SUMMARY.—While our knowledge of the etiology and intimate processes of disease is at best very limited, and while telluric and other conditions exercise, upon our states of health and disease, influences not as yet comprehended, recent progress in biological science has caused much light to be shed upon some of the causes of various infectious disorders. In view of bacteriological explanations we cannot doubt the potency of polluted water in causing the diffusion of some diseases and notably of typhoid fever. Like other harmful germs the characteristic bacilli of this disease can live for days in water whose gross appearance is that of purity, although the other microorganisms, such as are nearly always to be found in natural waters, tend to destroy the pernicious varieties.

There exists in all streams a capacity for self-purification. Biologically, this is manifested by a lessening of the number of bacteria present after several miles of flow, in case no fresh accession of inferior water occur. The pernicious varieties probably lose their harmful character or when not excessively abundant are so diffused throughout as to be virtually harmless. Dilution seems the main factor in inducing this improvement, but oxidizing processes are of considerable importance in purifying waters. In rivers with very slow current or in lakes, probably some bacteria settle. They unquestionably do so when the state of the water is such as to induce sedimentation. The application of this

¹ Kowalkowsky: Zeitschrift für Hygiene, ix. 1, page 89.

² Althöfer: Centralblatt für Bakteriologie und Parasitenkunde, July 25, 1890, p. 136.

Van Hettinga Tromp: Wasserstoffsuperoxide ter Desinfectie van Drinkwater, 1887.
Uffelmann: Jahresbericht, 1888, 47.

principle has produced beneficial results in the water-systems of certain cities. "Antagonisms" among bacteria shorten the life of disease-producing germs in waters where other (presumably harmless) kinds abound.

The excellent water supplied to New York is somewhat improved by the long flow through its superb aqueduct; yet too great care cannot be taken to keep the Croton watershed as free as possible from all habitations and industries. Only by vigilant and intelligent efforts can lasting and constant purity of the supply be maintained. Especially on summer days and during the time of high dry winds would it be advisable to moisten more assiduously the dusty and much-frequented walks and roads about the Central Park Reservoir, as the deposit of much undesirable dust and accompanying bacteria in the water (shortly before its distribution throughout the city) could thereby be prevented.¹

It is more economical and much safer to prevent contamination than it is to use filters when the water has become dangerous. Large filters, when very carefully managed, effect a great improvement in inferior waters;² but they do not prevent all disease-germs from passing through.³

It would be a most prudential act for the State to restrict the present devastation of its fine woodlands, and we should encourage the planting of at least one tree for every one hewn down. Forests afford a very valuable means of water-storage at the fountain-heads of our streams and aid greatly to preserve the desired constancy of flow.

Inasmuch as impure water probably causes disease oftener than we can demonstrate, and as there is unfortunately an immense body of irrefutable proof of its frequent harmfulness, all suspected water—and this especially at time of an epidemic—should, like all other foods, be cooked. Concerning such liquid foods as water and milk it may be said that a very brief boiling, as I have elsewhere indicated,⁴ makes them free from the infective property which they in an uncooked state might possess.

¹ Unclean dust can be carried very far; but, although the subjects are closely related, I will here merely intimate that the excessive filth of our streets will be sufficiently remedied only when our greater and lesser public servants are made to realize the importance of cleanliness in every sense of the ill-understood word. Unclean streets and dwellings among the poor can cause disease among the opulent. The filthiness of individuals can endanger the health of the many.

² Currier: *Medical News*, April 27, 1889.

³ Fränkel: *Deutsche medicinische Wochenschrift*, December 12, 1889, pages 1023, 1025.

⁴ New York Medical Record, June 14, 1890. New York Medical Journal, June 21, 1890.

REVIEWS.

MEDICAL DIAGNOSIS WITH SPECIAL REFERENCE TO PRACTICAL MEDICINE. A GUIDE TO THE KNOWLEDGE AND DISCRIMINATION OF DISEASES. By J. M. DA COSTA, M.D., LL.D., Professor of Practice of Medicine and of Clinical Medicine at the Jefferson Medical College, Philadelphia; Physician to the Pennsylvania Hospital; Consulting Physician to the Children's Hospital, etc. Illustrated with engravings on wood. Seventh edition, revised. Philadelphia: J. B. Lippincott Company, 1890.

If the custom of prefacing a book with a motto were universal, none better could be found for this than *experto crede*, for it contains the condensed experience of one of the greatest living diagnosticians. A diagnosis may undoubtedly be made in the laboratory from the study of sputum, blood, or urine, but it will be always a partial and frequently a negative one. For example, the knowledge that sputum is or is not tubercular may be of great value, but in either case it is not so much the disease as the patient that is to be treated, and to this end the diagnosis must be, in the fullest sense of the word, *physical*. It is the constant recognition of this fact that has made this book the foremost of its kind and has led to its translation into the principal European languages.

The fact that one of the busiest of practitioners, a hospital physician, and a teacher, should be able to produce such a book, is surprising to those who are not unaccustomed to work and have ample time to devote to it. The ability to keep abreast with the rapid march of progress in every department of medical science can only be explained by the statement which is, after all, a mere truism, that the acquisition of knowledge, like that of other property, is easiest to him who has most.

It is unnecessary to enter into any detailed notice of a book which has gone through so many editions. Its most prominent feature, if one can speak of prominence in connection with symmetry, is that each chapter is so thorough that the specialist in any department of medicine may obtain valuable assistance in the diagnosis of obscure cases.

It is interesting to trace the progress of diagnosis in the successive editions and especially in connection with those subjects of which our general knowledge has advanced the most. Those are doubtless the diseases of the nervous system, of the digestive system, and of the blood, and the author is to be congratulated on his success in gleaning the best in each of these fields and in winnowing out an enormous amount of chaff.

The reviewer, in common with all who open this book, becomes interested in its lucid descriptions of the phenomena of disease, their con-

trasts and resemblances, recalls almost forgotten cases which had perplexed or baffled him, turns over the leaves with the object of finding some information concerning them, and is invariably successful. Such a case was reported by the writer in 1881,¹ under the title of "Asynchronous Contraction of the Cardiac Ventricles, with Remarks upon Reduplication of Heart-sounds," a similar one having been reported by Leyden in 1868. On page 403, DaCosta says: "A peculiar kind of irregular action of the heart has been much discussed under the name of *hemisystole*. Leyden pointed out that there were cases in which with every two beats of the heart only one beat of the pulse was felt, and attributed this to the right ventricle alone contracting alternately with the left. Different explanations of the fact have been given by different authors, but the observations of Riegel and Lachmann, while they do not strictly confirm the alternate action of the ventricles as the cause of the phenomenon point to irregular contraction of the muscles of the heart as the cause."

This, although interesting, is somewhat inconclusive, and the question seems to be one in which the *a priori* improbability of asynchronous ventricular contraction is allowed too much weight. The possibility of independent contraction of the ventricles has been demonstrated by Prof. W. Gilman Thompson, of New York, in his valuable paper on the "Movements of the Heart," in the *Reference Handbook of the Medical Sciences*, vol. iii. p. 571. He paralyzed the right ventricle of a pigeon's heart by injection of aconite, and then stimulated the left ventricle to contract by glonoin, one per cent., applied externally. An instantaneous photograph, taken during the application, showed the right ventricle to lie "like a loose cover on top of the firmly-contracted left ventricle." While this does not actually demonstrate alternate ventricular contraction, it would, we think, show its possibility even in the absence of the clinical facts which, in our opinion, indicate it.

This case has been alluded to chiefly with the object of showing the confidence with which one may turn to this work for enlightenment upon the anomalies of clinical experience and is but one of many examples of the sort.

The book is typographically almost perfect, the only error of the sort being so glaring as to explain itself. We refer to the statement that the number of white blood-corpuscles is to the red as one to fifty, it being scarcely necessary to say that the printer has omitted a cipher in the last number.

F. P. H.

FAMILIAR FORMS OF NERVOUS DISEASE. By M. ALLEN STARR, M.D., PH.D., etc. New York: W. Wood & Co., 1890.

DR. STARR has written, as was to be expected, a very readable and useful book. The title is unfortunate, for it cannot be said that some of the diseases most fully described in this work, involving as they do some of the most complex questions of cerebral and spinal localization, are familiar; especially to the "general practitioner," for whom the

¹ Archives of Medicine, August, 1881.

book appears to be written. As the title implies, the work is not a systematic treatise on nervous diseases, but a collection of papers on some of the more *prevalent* diseases of the nervous system. Such a scheme has both advantages and disadvantages. On the one hand, it permits the author to address himself more directly to the profession at large, and to attempt to lift his great subject out of the narrow rut of specialism in which some desire to keep it. There is nothing in Dr. Starr's book but what ought to be known to every practising physician and surgeon in the land, and it will have served its purpose well if it helps to make *familiar* some forms of nervous disease which are to many as yet a mystery. On the other hand, Dr. Starr's book may be thought by some, because of its author's self-imposed limitations, to savor of incompleteness. On this we express no opinion, but are content to take the book on its merits, which are many, and to hope that its author may in the ample future rise to the dignity of a more complete treatise.

More than one-half of the book is devoted to a study of the localization of lesions in the cortex, the basal region, and the cord. This is not only the most important half of the book, but for simplicity and brevity it is one of the best clinical studies of the subject of which we have knowledge. It is founded largely upon the author's own clinical and pathological work, which gives it freshness and additional value. The cortical areas governing language are especially well described, with lesions affecting them. The complicated subjects of aphasia, agraphia, word-blindness, and word-deafness are so clearly outlined that it seems to us they cannot be difficult to comprehend, as far, at least, as our present knowledge extends. The localization of spinal cord disease, which has assumed so much importance in recent surgery, is described in two very full chapters, well illustrated. Dr. Starr's well-known studies of the segments of the cord are here reproduced in tabular form.

The surgery of the brain and cord, while not by any means slighted by Dr. Starr, might perhaps have been more fully discussed, and more credit given to the as yet not over-large number of workers in these two fields. Dr. White and Dr. Deaver, both of Philadelphia, have performed notable operations for spinal cord lesion. The latter's case, if we mistake not, was one of the first operated on in this country, and while from the nature of the case the operation was not successful, it threw a not unimportant light upon the subject; while Dr. White's case was followed by quite brilliant results. The author, however, shows a wise conservatism on the subject of brain and cord surgery, which undoubtedly has been in danger of being overdone.

The next most important subject in the book is multiple neuritis, which is treated of rather briefly. The chapter is a concise statement, and seems to us to be an abridgement of Dr. Starr's more elaborate lectures on the same topic published a few years since.

The remainder of the book is mostly occupied by papers by Drs. Skinner, Peterson, Vought, and Goodkind on locomotor ataxia, paralysis agitans, chorea, and the "ordinary forms of insanity." This last-mentioned paper on insanity, by Dr. Peterson, is quite a notable production, in which, if he does not exhaust the subject in fifteen pages, he at least gives a very condensed statement of diseases of the mind. He adopts a classification for the benefit of the "general practitioner."

which German writers would probably regard as a reversion to a lower, or at least a *primitive* type. In this we believe he is in accord with advanced pathological work, and that the future will see a more simple classification of the insanities than some of those now in vogue. All the papers by Dr. Starr's clinical assistants are founded upon cases observed in the Vanderbilt clinic, and are rather in the nature of reports of good work done in dispensary practice than of complete monographs upon their individual subjects.

The book closes with a very timely chapter on electricity as a therapeutic agent. Dr. Starr does not hesitate to show his scepticism on a subject about which too many therapeutists are at loose ends. His conclusions are that static electricity offers nothing beyond an interrupted galvanic current; that the constant galvanic current has electrolytic and cataphoric action, and aids nutrition; that the interrupted galvanic and the faradic currents also aid nutrition; that organic nervous diseases cannot be influenced by electricity; and, finally, that functional nervous diseases are often benefited in an uncertain way by the empirical use of this agent. All of which we firmly believe are correct.

J. H. L.

A MANUAL OF MODERN SURGERY: AN EXPOSITION OF THE ACCEPTED DOCTRINES AND APPROVED OPERATIVE PROCEDURES OF THE PRESENT TIME. By JOHN B. ROBERTS, A.M., M.D., Professor of Surgery in the Woman's Medical College of Pennsylvania; Professor of Anatomy and Surgery in the Philadelphia Polyclinic; Lecturer in Anatomy in the University of Pennsylvania. 8vo., pp. 800, with five hundred and one illustrations. Philadelphia: Lea Brothers & Co., 1890.

THE title Modern Surgery is entirely justified, for the reader will find very little of tradition within these pages which has not withstood the strong light of recent criticism and investigation. Not a small advantage of a new book is the absence of the necessity for modernizing old material from former editions, and in this instance, from first to last, the thought is essentially modern. Of necessity, much depends upon the personal opinion of the author as to what views shall be given as the best. It is not to be expected, for instance, that all surgeons of to-day will endorse the preference given to the hooks in the treatment of fractured patella. Indeed, many consider their use quite as unjustifiable as our author thinks wiring to be. Not often does it happen, however, that his convictions fail to coincide with generally-received opinion.

The attitude of the work upon the various abdominal and intestinal operations is quite in accordance with late views of the best abdominal surgeons. He counsels early operation, rapidity, accuracy, cleanliness, irrigation and drainage, with little or no opium, and these are the essentials of success.

The section on compound fractures is well up to date, and gives a clear statement of methods and results as seen in good hospitals of the present day. The same is true of the discussion of extensive contused and lacerated wounds. Instead of the arbitrary terms "simple" and

"compound," as applied to fractures, the use of the accurate terms "closed" and "open" is much to be commended.

The chapter on Diseases and Injuries of the Reproductive Organs is very much condensed, as might perhaps be expected in a work of this size. The description of the repair of perineal laceration is not at all clear, nor is it exact. Very meagre attention is devoted to gonorrhœa. The directions for treatment are given in general terms, and the complications are simply named categorically.

A brief, but exceptionally good, account of lithotomy and lithotrity is greatly aided in value by well-made and well-chosen illustrations.

The author is not enthusiastic over the radical cure of hernia, and the operations for it are treated in a cursory way.

The use of the Esmarch bandage to secure "avascularity" prior to amputation is referred to on page 745. The word "avascular" means without bloodvessels and not without blood.

The writer has given considerable attention to the details of plastic surgery, especially of the face, and many of the excellent ideas of his monograph on deformities of the nose are here incorporated. An excellent feature is the frequent giving, in parenthesis, of solution strengths and approximate doses.

In no respect has a greater departure taken place in recent times than in the management of cranial lesions. One of the most distinctive features of the book is the treatment of this subject, to which the author has brought much study and no little experience. He would abandon the use of the term concussion of the brain and substitute contusion or laceration. He states (p. 360) that "the symptoms denominated 'compression of the brain' are probably the evidences of encephalic inflammation rather than of brain compression." The treatment of cranial fracture is admitted to be more heroic than is generally taught. He trephines (see page 361) all fractures which show "brain symptoms," whether simple or compound, with or without depression, and whether fissured or comminuted. Just what these brain symptoms include is not, however, made clear in this connection. The advice is in closed, *i. e.*, simple, fissured fractures without evident depression, but "with brain symptoms," to incise the scalp and trephine. Since, in the absence of depression, fissured fracture cannot usually be found without incision, this is equivalent to saying, Where brain symptoms exist incise the scalp and look for fissures. A more definite statement would be advisable as to what degree of brain disturbance would justify the extensive incision necessary to exclude fissure in many cases. Whether the author does or does not mean compression symptoms, it would be better to say it, if only for the sake of the student and the occasional operator. Careful consideration leads us to think that he does not.

The fractures *without* brain symptoms, for which he may operate, are: (a) Either simple or compound fissured fractures with depression. These he possibly trephines, deciding by degree of depression and number of fissures. (b) Either simple or compound comminuted fractures without depression. These he probably would trephine; that is, he would do so unless the comminution were inconsiderable. Gun-shot, like punctured fractures, are invariably to be trephined. A table is given which is concise and valuable for ready reference, but the author's position is made unnecessarily obscure both by the absence of definition of "brain symptoms" and by the following clause in another

part of the book. When speaking of compression (p. 197) he says: "Depressed bone should be elevated, foreign bodies extracted, pus evacuated by trephining, extravasated blood removed and further bleeding prevented by opening the skull, turning out the clots, and tying the vessel. *These operative procedures are proper only when the existence of compression is clearly established, and its cause and location known*" (italics ours). This last position is that of the older surgeons, and is not consistent with the following extract from the table, for example: "In closed comminuted fracture, with evident depression and *without brain symptoms* (italics ours), incise scalp and trephine." There is difficulty in learning from the work just what the writer's real views are, partly because of peculiarities of arrangement. Some general account of operative indications and contra-indications according to symptoms is given under the heading of localization. Other mention is made under compression, and too little that is definite when speaking of fracture. He looks upon incision of the scalp and trephining as "exploratory rather than therapeutic measures." "Trephining properly performed is in itself so free of danger that in a doubtful case the patient had better be trephined than allowed to run the risk of death, epilepsy, or insanity." On this ground opinions still differ, and time alone, with accumulated statistics of aseptic operations, can decide. The procedures here advocated are possibly safe in skilled hands, such as the author's. In a general work on surgery a clearer statement of other views might not be out of place.

An extremely lucid and sensible discussion of fractures of the lower end of the radius deserves mention. Bond's splint, it is said, should never be used, but the moulded metal splint of Levis, a straight anterior splint with a wooden pad for the radial curve, or a single straight dorsal splint, should be employed.

The book is one of a class which is much needed to-day; a surgery written from the standpoint of an active man who has not been too loath to unlearn the methods of the past.

Especially to be commended is the judgment used in selecting illustrations. Many excellent ones are original and add greatly to the clearness of the text.

G. E. S.

ELECTRICITY IN THE DISEASES OF WOMEN, WITH SPECIAL REFERENCE TO THE APPLICATION OF STRONG CURRENTS. By G. BETTON MASSEY, M.D., Physician to the Gynecological Department of Howard Hospital, etc. Second Edition, revised and enlarged. Pp. xii., 240. Philadelphia and London: F. A. Davis, Publisher, 1890.

THE appearance of a second edition of this little book within a surprisingly short time after the first is a convincing proof of the general interest of the subject. Believing that there is more in the work than would appear from the hasty way in which it has been discussed by former reviewers, we have felt disposed to consider it at some length, in view of the growing importance of the matter of which it treats. The fact that the author is an enthusiast, and that, as such, he has been brought into frequent antagonism with the ultra-surgical party of

gynecologists, should in no way detract from the candid reader's appreciation of his conservative attitude. The results of electro-therapy have been in the main discredited either by those who have allowed themselves to be prejudiced against it without examining into its claims at all, or by others whose adverse criticism has been founded upon insufficient evidence. In this department of medicine, as in every other, the accumulated experience of trustworthy observers should always be accepted as outweighing the results of those who report a few isolated cases. We view with suspicion the deductions of a laparotomist which he bases upon a dozen cases; why should we not be equally distrustful of a writer who, after treating half a dozen cases of uterine fibroid according to Apostoli's method (as he conceives), feels competent to publish a sweeping denial of its value? On the other hand, the intelligent practitioner must be no less suspicious of the electrical enthusiast who affirms that no pelvic affection can resist the influence of the subtle agent which has become such a potent factor in therapeutics.

Since the main features of this manual were set forth in the notice of the first edition it is unnecessary to comment upon them. Much new matter has been added, showing the results of the author's personal experience in the treatment of other pelvic diseases than those which were before mentioned. Over half of the volume is devoted to theoretical considerations, descriptions of apparatus, mode of application, etc., all of which are briefly but clearly stated, as is fitting in a popular work. Chapter V., containing details with regard to the preparation and after-treatment of patients, is especially valuable.

Chapter XI. (including forty-three pages) receives the attention which its importance demands. The author's conclusions, based upon his personal experience of the electrical treatment of these tumors, are certainly not extravagant. He believes that:

1. "A properly-conducted electrical treatment of solid fibroids is harmless, will remove the irritation and pain due to their presence, arrest further growth, and almost invariably cause a gradual diminution in their size.
2. Bleeding fibroids may be entirely cured of the hæmorrhagic tendency and pain, arrested in growth, and gradually lessened in size.
3. It is possible for the diminution in the size of the tumor to end only in its complete disappearance.
4. In small intra-mural fibroids, surrounded by unimpaired uterine tissue, the current applications tend to promote their disengagement from the uterine stroma, and extrusion either into the uterine or peritoneal cavities. In the former case a complete cure may result by a delivery of the tumor, and in the latter case a lessening of its symptomatic importance.
5. The time necessary for a satisfactory shrinkage should not be too sparingly measured with the slow cases. Quick symptomatic cure and slow shrinkage are often associated in the same case.
6. In fibroid tumors that have undergone cystic degeneration a treatment by strong currents may do harm, being apt to set up changes in the liquid contents of the cavities that may result in septicæmia."

The author thinks that the electrical current causes trophic changes in the growth, or, as he happily expresses it, "the electrical applications are like blows upon a nerve containing trophic filaments, which are followed by degeneration and absorption of the supplied area in proportion to the injury." He properly prefers intra-uterine cauterization to electro-puncture per vaginam, reserving the latter for cases in which

the cavity is so small that an electrode cannot be introduced, or in which the tumor is subperitoneal and pedunculated. Very hard tumors are less adapted for electrical treatment. The best results are to be expected in the case of submucous fibroids. Several cases are reported showing the favorable results obtained, especially as regards the relief of hæmorrhage, the tumor in every instance being considerably reduced in size.

Chapter XII., on uterine hæmorrhage, is condensed but valuable. The results obtained by the author in the electrical treatment of chronic endometritis are certainly most encouraging; but even conservative gynecologists would question the possibility of curing an extensive bilateral laceration of the cervix without an operation. In introducing the important chapter on chronic inflammatory diseases of the uterine appendages the author throws down the gage to the laparotomists. He is not far from right when he says that "a conservative reaction from this war-time in abdominal surgery may be predicted with confidence." On the other hand, however positive may be the results obtained in the electrical treatment of ovarian troubles, we can hardly assent to the view that a well-recognized pyosalpinx should be treated by the electrode instead of the knife, even though there has been no recent perimetritis.

With the author's remarks on pelvic pain we are in full accord, though it is a matter for regret that so little space is assigned to this important subject. We believe that in the relief of this symptom the electrical treatment has achieved its greatest triumphs, as opposed to empirical surgery, and it is reasonable to suppose that its benefits will in time be so generally recognized that laparotomy, as a tentative measure, when no serious organic disease is recognized, will in the near future be regarded as absolutely contra-indicated. In the section on "Menorrhagiæ" (a term which is suggested as a substitute for dysmenorrhœa, though it presents no striking advantages over the latter) the author discusses the etiology of painful menstruation, which he designates somewhat vaguely as "almost entirely a neuro-muscular phenomenon." "Menorrhspasm," or spasmodic contraction of the os internum, is described in rather ponderous terms as "a neuro-myotic storm of the uterine neuro-muscular apparatus, which renders the excretion of the menstrual fluid temporarily impossible." This theory is tenable, but there is danger that the general reader may infer that divulsion is an operation to be entirely abandoned. Much as it has been abused, we would be sorry to see such conclusions drawn, since in a certain class of cases (especially when the question of sterility is concerned, as well as that of dysmenorrhœa) there is a permanent mechanical, as well as a purely spasmodic, obstruction of the cervical canal. The author's views regarding the inadvisability of hasty resort to local treatment in the case of young girls meet with our hearty approval.

In the chapter on the electrical treatment of uterine displacements expression is given to the belief that there is a future for this method in cases of prolapsus due to relaxations of the muscular supports of the uterus. This we must admit when we reflect how much has been accomplished by pelvic massage, which is necessarily less efficient in its action.

Chapter XVII., on extra-uterine pregnancy, is brief, and somewhat disappointing in view of the importance which this subject has assumed of late. We are pleased to note that the author, unlike some enthusiastic electro-therapeutists, recognizes the fact that there are limitations

and contra-indications to the application of his favorite agent. He does not extend its use to pelvic abscess, hæmatocele, and cysts of the ovary and broad ligaments. In fact, his claims are, with few exceptions, reasonable and are urged in a calm, judicious spirit, which commends itself to the impartial reader far more than intemperate advocacy of any method.

This work is necessarily limited in its scope, and is much condensed. For the general practitioner the theoretical predominates a little too much over the clinical. We have our doubts as to the propriety of advising practitioners to procure and use the nice apparatus needed in the electrical treatment of uterine fibroids. Personally, we believe that even gynecologists would do better to entrust their cases to special workers, who have the time and experience necessary to test thoroughly the value of this treatment. The tendencies of the average gynecologist are too surgical to allow him to spend the time which should be devoted to Apostoli's method before it becomes evident that a given case cannot be benefited except by an operation. On the other hand; the application of electricity to ovarian and pelvic neuralgia requires less complicated apparatus, less special skill, and may well be entrusted to the general practitioner.

The author does not promise too much, but calls attention clearly to the fact that there is still much to be learned regarding the special application of this agent in gynecology.

Modest and unpretentious as it is, the book is a valuable addition to the literature of gynecology, and deserves the general approbation which it has received.

H. C. C.

DESCRIPTION OF THE JOHNS HOPKINS HOSPITAL. By JOHN S. BILLINGS, M.D. Baltimore, 1890.

TIME and space will permit only a brief notice of the splendid edifice of the Johns Hopkins Hospital. It stands the model hospital of the world, as perfect as art and science and munificence can make it in our day. The handsome volume which describes it is itself a triumph of skill. It contains, besides a concise narrative of the inception, construction, and completion of the hospital, the addresses delivered at the opening of the institution, May 7, 1889, by Francis T. King, President of the Board of Trustees, and Dr. John S. Billings, who has been from the first the moving spirit, the *genius loci*, of the entire evolution. To the text of the volume are appended fifty-six elaborate plates that serve to illustrate every detail of the structure.

It is not likely that this great hospital will be many times duplicated. The ignorance and poverty of municipalities will long hinder the establishment in our large cities of public buildings like these; and few private charities can compass such results. But the influence of such an exemplar will be far-reaching and permanent. Already, before a single stone had been laid, the construction of hospital buildings throughout the country was modified by the crude preliminary plans that were drawn up at the instance of the trustees of the Hopkins

legacy. No one now, in any part of the civilized world, can think, or talk, or act in the matter of hospital construction without taking into account the Johns Hopkins Hospital.

We may not, however, dismiss this subject without first considering whether it be desirable to seek the universal adoption of the plan upon which this hospital is constructed. Undoubtedly, it furnishes an admirable institution for the display of the highest resources of the healing art, and for the acquisition of knowledge regarding disease. It is well to have in this country, at least, one such hospital. But, is it worth while to rear in every city such expensive edifices for the accommodation of the sick? We think not. Experience indicates that buildings like the New York Hospital, or like the new Presbyterian Hospital in Chicago, will afford equally satisfactory results with but a tithe of the expense. After all this vast outlay of over two millions of dollars, the Johns Hopkins Hospital will accommodate only two hundred and twenty-five patients; while the Chicago Presbyterian Hospital accommodates one hundred and seventy-five patients, about equally distributed between common wards and private rooms, in a fire-proof building that did not cost over two hundred and fifty thousand dollars. For this sum an edifice has been erected, in the form of the capital letter F, upon a lot measuring 150 x 170 feet, with basement and five stories, open to light and air in every direction. The kitchen is placed in the fifth story; the boiler and the laundry occupy a detached building; and yet, room has been found for a pleasant lawn beside the hospital. Wide halls and excellent ventilation make the entire structure airy and cheerful; while perfect cleanliness and careful attendance have, during the last hospital year, reduced the mortality among 1351 patients to 6.43 per cent. Results like this should make one pause before deciding upon the Baltimore plan as the only *ne plus ultra* in hospital construction.

H. M. L.

THE MILROY LECTURES FOR 1890. THE CAUSES AND PREVENTION OF PHTHISIS. By ARTHUR RANSOME, M.D., M.A., F.R.S., Hon. Physician to the Manchester Hospital for Consumption and Diseases of the Throat. London: Smith, Elder & Co., 15 Waterloo Place, 1890.

THIS volume of 146 pages contains as much information upon the subject of phthisis as could well be crowded into so small a compass. The importance of the subject in the mind of the author may be seen by the following lines from the first page of the book: "Tubercle, in its various forms, at the present day, carries off annually nearly 70,000 persons. In the form of phthisis, at ages between fifteen and forty-five—the most useful stages of human existence—it kills more than one-third of the people who die, and nearly half between fifteen and thirty-five."

He then goes on to give a most excellent summary of the changes in modern thought in regard to the disease, in respect to its etiology, communicability, and methods of transmission, as well as some outline wherein modern ideas must differ from those of the older pathologists. It is unfortunate, however, for the sake of exactness in diction, that the

author has made the common mistake of using the words "phthisis" and "tuberculosis" as interchangeable; a fault the more to be regretted for the reason that it is upon such errors as this that all the opposition there is to the specific nature of the bacillus of tuberculosis is mainly based. Of course, it is known that there may be phthisis which is not due to the activity of the bacillus of tuberculosis, but so little stress is laid upon this fact by clinical writers, that the subject is still in some confusion from that cause.

Information in regard to the distribution of phthisis (tuberculosis), its destructive effects upon the human race, its predisposing causes (atmospheric, climatic, etc.), and some of the proper methods for its prevention can hardly be found in a more compact form, however, than in this book. Especially interesting are a chart showing the geographical distribution of phthisis, one showing the distribution of the Leprosy Hospitals of the British Isles during the Middle Ages, and one showing the distribution of phthisis according to the rate per thousand of living.

H. C. E.

LYMPH-STASIS, OR RETARDATION OF LYMPH AS AN ELEMENT IN THE CAUSATION OF DISEASE, ESPECIALLY IN REGARD TO SCROFULA AND TUBERCULOSIS. By WAYLAND C. CHAFFEY, M.D., London; Fellow of the Royal Medical and Chirurgical Society and Member of the Pathological Society of London, etc. (Graduation Thesis with Appendix.) London: H. K. Lewis, 136 Gower St., W. C., 1890.

BEARING upon the same subject as the preceding in a general way, comes the little book with the above title. The drift of the author's argument can be best seen by an extract or two. Alluding to the "almost constant presence of caseous material in some part of the body in cases of tuberculosis," after some explanatory remarks, he asks the question "Is the general infection independent of the caseous glands as a *focus*, in some cases, at least, and due to the subsequent introduction from without of the same species of microbe that was resident in the caseous gland?" and says: "This last view I am induced to believe is the correct one." "My observations lead me to believe that it is generally by its retarding effect upon the lymph-current of an organ that the caseous gland renders the part depurated, specially vulnerable to the attacks of the disease germs in general, the bacillus of tubercle included." This retarding effect upon the lymph-current by caseous areas is the basis of the statements that the author makes, and which he supports by evidence drawn from records of more than 105 autopsies which are tabulated at the end of the book. Short extracts from such a work give a very poor idea of the argument, and as to the foundation of this latter the best judgment can be formed only by seeing the original. The ideas are good, however, and it is possible that they form an explanation of some of the difficult problems that confront the pathologist for solution in the study of the morbid changes occurring in disease.

H. C. E.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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THE PHARMACOLOGY OF MORPHINE AND ITS DERIVATIVES.

It is agreed that the central nervous system is the part primarily affected by morphine, and the symptoms which it produces are described as divisible into a narcotic and tetanic stage.

In the descriptions of the morphine actions hitherto published it has always been assumed that the occurrence and sequence of the two stages of narcotism and tetanus are a necessary result of the action of the drug in the nerve-cells, the explanation given being that morphine first depresses and then stimulates the spinal cord.

In an investigation by STOCKMAN and DOTT it has been found that the sequence of depression and tetanus is entirely a question of dosage, and of how much morphine actually reaches the spinal cord.

In the present state of our knowledge it would be useless, even to speculate, as to what changes morphine brings about in the nervous system, small amounts of the alkaloid coming in contact with the gray nerve-cells interfere with their vitality and chemical changes only in so far as to inhibit or depress their proper activity, whereas larger amounts cause much more profound changes, apparently leading to irregular and violent chemical action within them, which leads to *similar irregular and violent discharges of nerve energy*, followed by exhaustion. During the first condition the cells are more or less incapable of conducting impulses or of acting reflexly, whereas, in the second, they are completely changed in these respects, and respond vigorously to the slightest impression. It is impossible to characterize the changes more definitely.

With regard to the action of morphine on motor nerves, great differences of opinion have been expressed by different authors. The older observers, finding that the motor nerves were considerably depressed in electric irrita-

bility at the end of the poisoning, concluded that the alkaloid had a directly paralyzing effect on the end organs. Stockman and Dott find that very large doses of morphine do paralyze the terminations of motor nerves, but ordinarily death ensues before the depression is marked. With therapeutic doses in man it is hardly possible that even a trace of this action is present.

With sensory nerves the state of affairs seems to be much the same—that is, if large doses could be applied directly to the nerve terminations, the morphine would act as a paralyzant to the nerve tissues, but by the ordinary methods of administration its effect is practically *nil*.

Codeine. Codeine is the methyl ether of morphine, a molecule of methyl having replaced one of the hydrogen atoms. Its action is exerted on the central nervous system, and has a close resemblance to that of morphine. It causes an evident narcotic stage, followed by a condition of increased reflex excitability which amounts to tetanus if the dose be large enough. The narcotic stage is, however, shorter and much less deep than with morphine, and if large doses be given to animals, is often hardly noticeable, or may be quite absent. In man the narcotic effect is feeble; very small doses depress the spinal cord, this being succeeded by an increase of reflexes; while larger doses cause tetanus, either at once or after a stage of depression. On motor nerves its paralyzing action is very decided. The narcosis is always slight; the animal can be easily aroused. There is no very marked analgesia, and when the dose is increased, this, instead of deepening the narcosis, causes a condition of reflex excitability.

Ethylmorphine. This substance is the ethyl ether of morphine, and is analogous to codeine. Bochefontaine has published a short paper on its physiological action, which he describes as being exactly similar to that of strychnine. He used such large doses, however, that he missed the preliminary narcotic effect. Stockman and Dott have concluded that ethylmorphine has an action similar, or nearly so, to that of codeine. If the dose be properly chosen, one can easily distinguish in animals a narcotic and a tetanic stage.

Amylmorphine. Its physiological action was found to be similar to that of the two preceding bodies.

In these three bodies, methyl-, ethyl-, and amylmorphine, the same hydrogen atom in morphine has been replaced by an alkyl radical. They are, therefore, substitution derivatives. We find that the action of all three substances is practically identical, and it seems quite indifferent which radical is introduced so long as it replaces the same H atom. Theoretically, there is possibly a difference in the actions of the three substances, but it must be entirely quantitative not qualitative. In all the narcotic action of morphine is much diminished; the tetanic action and the action on motor nerves are increased; while the lethal dose, on account of the tendency to convulsions, is much smaller. This action is, however, of essentially the same nature as the morphine action; that is, the same parts of the central nervous system are affected, and in the same way, but not in the same degree.

Other substances, such as acetylmorphine, diacetylmorphine, benzomorphine, and dibenzomorphine, were compared to morphine, and their action was found to be the same in kind, differing only in degree. Their tetanizing power is much greater, while their narcotic action, although visible after

smaller doses, is never nearly so profound. Increase of dose, instead of deepening the narcosis, brings on tetanic symptoms. The depressant action of small doses on the cord, and especially on the respiratory centre, is very much greater than that of morphine.

Compared with codeine, they induce an equal narcotic effect with about one-tenth of the dose; while about a three-times-larger dose is necessary to cause tetanus.

Several chlorine derivatives of morphine were examined, which all showed the characteristic actions of morphine on the central nervous system. In addition they act more or less energetically as muscle-poisons, soon destroying the contractile power of the voluntary muscles with which they first come in contact at the place of injection, and more gradually affecting the other muscles of the body. Chlorine, it is well known, is a powerful muscle-poison, and its introduction into other groups makes the bodies so formed marked paralyzants of muscular tissue.

The research was undertaken with the view of determining the influence of chemical change in the physiological action of certain alkaloids. From the examination of one substance it is unwise to draw any wide-reaching, general conclusions. It seems certain that so long as the chemical changes are restricted to what may be called the outlying groups of the molecule, very little alteration takes place in the physiological action. The change which does take place does not depend so much on the substituting body as on what part of the molecule is substituted. When a change is made in the kernel or groundwork of the molecule, then the action is much more profoundly altered.—*British Medical Journal*, July 26, 1890.

TREATMENT OF NOCTURNAL INCONTINENCE IN CHILDREN.

The following simple theory to explain one of the causes of nocturnal incontinence and its equally simple treatment will interest many who have to treat this often trying and inconvenient habit.

Dr. van Tienhoven, of The Hague, suggests that in these patients, though the bladder acts normally through the day, it misbehaves at night. The question is, Shall the musc. detrusor urinæ or musc. sphincter vesicæ, or both, be blamed? Dr. van Tienhoven believes that the musc. sphincter is not strong enough to keep back the urine which collects in the bladder in the early hours of the night and permits it to find its way into the prostatic portion of the urethra. The musc. detrusor is thus reflexly stimulated and the bladder is emptied.

In order to prevent the urine from running into the urethra in this way the children were made to sleep with the pelvis elevated. In this position the bladder is capable of holding a certain amount of urine before the liquid reaches the level of the urethral opening.

The foot of the bed must be elevated so that the bed forms an angle of forty-five degrees with the horizontal. The children should be sent to bed with empty bladders, and should not take any liquid just before retiring. They sleep well in this position and do not complain. Fourteen cases were treated by this simple method only, and were cured in a short time.—*Correspondenzblatt für Schweizer Aerzte*, No. 18, 1890.

INTESTINAL ANTISEPSIS IN TYPHOID FEVER.

The following treatment is recommended by PROFESSOR TEISSIER, of Lyons: Morning and evening a capsule of seven grains of alpha-naphthol, with salicylate of bismuth. Sponge-bath once in twenty-four hours. To restore the action of the kidneys after the mid-day sponging, a rectal injection is given of one drachm of the extract of cinchona, and eight to fifteen grains of the sulphate of quinine dissolved in sulphate of valerian. The diet is restricted to Bordeaux wine, milk, and broth.

The author states that he has employed this treatment in fifteen cases of typhoid fever, some of which were of exceptional severity, one case only dying, due to suppurative nephritis occurring at the close of the disease. In almost all of these cases complete antiseptis was realized about the fourth day of the treatment, this being recognized by the green tint of the urine. The temperature was lowered progressively, the albuminuria disappeared, the spleen regained its normal volume, and the tongue became moist and lost its furred condition.

After a regular fall of temperature there then occurred a series of marked thermic oscillations, lasting from four to eight days, the patient then passing to the stage of convalescence, a stage of the disease which was remarkably short. He further adds that through all the duration of the treatment the typhoid aspect was wanting.—*Therapeutic Gazette*, No. 10, 1890.

TOXIC EFFECTS OF CASTOR OIL.

Fewer drugs have a more established reputation for mild and safe operation than ol. Ricini. Yet it would seem that occasionally it may play tricks, for which it is well to be prepared. DR. C. HANFIELD JONES reports four cases in which syncope occurred after using castor oil in moderate doses. The patients were robust and the syncope was not the result of hypercatharsis.—*The Medical Press*, No. 2671, 1890.

SECRETION OF IODIDES AND SALICYLATES.

PROFESSOR ROSENBACH and DR. POHL have studied with care the channels of secretion of the iodides and salicylates, and the result of their investigation is of practical interest and value in the use of these remedies.

To ascertain if the salicylate of sodium and the iodide of potassium were secreted by synovial fluid this fluid was tested for these salts, after death, in patients who had been taking these remedies just previously. The salicylic reaction was found, but the iodide was not present in the synovial fluid. A young man who had acute rheumatism, with fluid in the knee-joint, was given salicylate of sodium, and later some synovial fluid was drawn off, and when tested gave the salicylic reaction. In several patients with pleuritic effusion, who took both the iodide and the salicylate, the salicylate was found in the pleuritic fluid, but not the iodide.

Further tests were made on patients with nephritis, with ascites, and oedema.

Their experiments show that the salicylates are found not only in the

but also in the serous fluids of the body, normally, and when serous effusions occur. The salicylates are also found in œdema and in exudates containing pus, though in the last in small amount only. Salicylate of sodium was not present in the saliva, in the gastric juice, or bile.

On the other hand, the salts of iodine, given by the stomach or subcutaneously, are found in the urine and saliva, and, like the salicylates, in transudations into the skin, abdomen, and pleura; they are, however, not found in serous exudations or in those containing pus. Even when administered in large doses to healthy and diseased individuals, they were never present in the synovial fluid.

The iodides and salicylates differ from each other in this respect, that when the salicylates are administered they are widely distributed in the system, and may be found in all serous cavities as well as in the urine, while the iodides, on the contrary, are found only in transudations and never in normal or inflammatory effusions into joints or serous cavities.

The authors infer from such facts that the iodides are, therefore, useless in the treatment of articular rheumatism or inflammation of the pleura or peritoneum, since they do not reach the site of the disease; and, further, that since the salicylates are found in these cavities, they should be used not only in articular rheumatism but in inflammatory conditions of serous membranes.

Where the larger cavities are involved, as in pleuritic effusions, the authors recommend large doses of the salicylates, or their administration directly after thoracentesis. In fact, the injection of the salicylates into the cavity after tapping seems to have some advantages.

They believe that the rapid and successful course of a series of cases treated in this manner was the result of the administration of the salicylates combined with thoracentesis.—*Berliner klinische Wochenschrift*, No. 36, 1890.

SOME NEW CLINICAL EXPERIMENTS WITH DIURETIN.

KORITSCHONER has recently made numerous clinical trials at the medical clinic of Professor Schrötter, of Vienna, with the new diuretic *diuretin*, which is a mixture of sodium salicylate and theobromine. These experiments pertained to thirty-eight cases of general dropsy. Ten of these were cases of cardiac dropsy from chronic valvular disease; twelve cases were of dropsy from Bright's disease in some stage; in six the general anasarca was due to dilatation of the heart following emphysema or arterio-sclerosis; in four the cause of the dropsy was degeneration of the myocardium; in three it was hepatic cirrhosis; in two it was tuberculosis of the lung and serous membranes; and in one, cancer of the liver.

The formula which Koritschoner uses is as follows:

Salicylate of soda and theobromine	3j to 3ij.
Warm water	5v.—M.

Dose, a teaspoonful every hour or every two hours.

Diuretin should be given in rather large doses—little benefit can be expected from a less quantity than four grammes (sixty grains) a day; ordinarily, to get the full advantages of the drug, medium doses amounting to five or six, and maximum doses amounting to eight or ten grammes, in the twenty-four hours, should be administered.

Diuretin is generally well supported, even when its use is prolonged for months. It rarely causes nausea, even in chronic Bright's disease, when the appetite is gone, and but little food is tolerated. It does not cause vertigo; in rare instances patients complain of palpitation and temporary cardiac distress. Sometimes diuretin provokes diarrhœa.

As a result of these trials by the Vienna physician, salicylate of soda and theobromine was found to be a very powerful diuretic, and in only five cases did it prove to be without action; these were cases of chronic Bright's disease, arterio-sclerosis with fatty myocardium, tuberculosis of the lungs and of serous membranes—all had arrived at the last degree of cachexia, and succumbed in a few days after their admission to the hospital. In ten other cases, the action of the salt was much superior to that of digitalis, acetate of potash, and all other diuretics that had been administered, though but moderate benefit followed the administration of the remedy. In the majority of the patients (twenty-three out of thirty-eight) the effect obtained was excellent, the dropsical effusions rapidly disappeared, and general amelioration followed. There is some danger under the abundant diuresis caused by the drug, the ascites and œdema may disappear so rapidly as to cause dangerous collapse. On this account, Koritschoner urges that in cases of abundant effusions the remedy should be given with caution; he would, in fact, advise always to begin the treatment by a dosage of one drachm a day, and if this quantity makes no sensible increase in the urine, it may be augmented by fifteen grains a day till a sufficient result is obtained.

The diuretic action of this medicine is said to be more marked in cardiac dropsies than in renal or hepatic, yet it may render precious service in chronic Bright's disease. In fact, in this disease, where all the ordinary diuretics are apt to fail, the quantity of urine excreted often becomes augmented five or six times under the influence of the salicylate of soda and theobromine. In some cases of Bright's disease the remedy seems to exert its principal action in the intestines, producing an abundant serous diarrhœa, which, in a very short time, causes the œdema to disappear, without too great enfeeblement of the patient.

According to the researches of Schröder and Gram, the diuretic effect of the salicylate and theobromine is due to the excitant action of the drug on the renal epithelium. As the epithelium is the principal seat of lesion in chronic parenchymatous nephritis, it might be feared that diuretin would be injurious in Bright's disease. The observations of Koritschoner show that this fear is not well founded, and that diuretin excites the renal functions without exciting the kidneys. Thus, in two cases of acute scarlatinous nephritis when Koritschoner gave diuretin in large doses, the patient recovered with astonishing rapidity, and without any complications. Under the influence of the medicament, the blood corpuscles and hyaline casts were seen from day to day to disappear from the urine. This same favorable action of diuretin on the nephritic processes has also been noted in chronic Bright's disease.¹

The new drug has not as yet—as far as we have been able to ascertain—been much introduced into this country, and as theobromine is very expen-

¹ Wiener klin. Wochschr., September 25, 1890; Semaine Médical, October 15, 1890.

sive, and as the cost of a drug is an important item in the economies of many physicians and their patients, it is doubtful whether many serious trials will be made with diuretin for some time to come.—*Boston Medical and Surgical Journal*, No. 18, 1890.

MEDICINE.

UNDER THE CHARGE OF

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APHASIC AND AMNESIC DEFECTS OF SPEECH.

BASTIAN (*Lancet*, 1890, i. 1163) calls attention to the importance of a systematic and uniform mode of examination in the effort to discover the exact nature of a speech defect; as, unless this be made, a detailed diagnosis is extremely difficult. Speech defects of different kinds result from lesions in very different parts of the brain. While words are the vehicles of intellectual expression, the memory for words is fourfold, the four forms of verbal memory being registered in different parts of the cerebral hemispheres, the several centres being connected by commissures, and being called into activity by different combinations, according as we are listening, reading, writing, or speaking.

The four forms of verbal memory are these: (1) The auditory memories of words, which, we may say, are registered in the posterior part of the upper temporal convolution; (2) The visual memories of words, registered in some unknown part of the occipital lobe; (3) The glosso-kinæsthetic memories of words, or the memories of our articulatory sensations, which he believes to be located in the posterior part of the third frontal convolution; (4) The cheiro-kinæsthetic memories of words, or those of the sensations connected with writing movements, which he believes to be registered in the hinder part of the second frontal convolution. These last two centres are the sites from which, in speaking and writing respectively, volitional incitations issue through descending internuncial fibres, so as to arouse in appropriate modes the true motor centres situated in the medulla and spinal cord. He believes that the action of these last, as of all motor centres, is entirely devoid of all sensory accompaniments—that is to say, whilst movements are invariably preceded and incited by processes taking place in sensory nerve elements, and whilst the excitation of the movements invariably gives rise to a body of ingoing impressions (kinæsthetic) emanating from muscles, skin, joints, etc., the actual nerve processes excited in the motor centres proper are devoid of any conscious accompaniment, and are wholly incapable of independent memorial recall. What he calls “motor centres proper” are commonly called lower motor centres. “Kinæsthetic centres” is his term for the cortical motor

centres, since he is of the opinion that no motor centres exist in the cerebral cortex. He thinks that in what are termed cortical motor centres sensory results of different movements are registered, and that the reëxcitation of these centres constitutes the necessary antecedent—the veritable stimulus—for the reproduction of the movements to which they are related. The excitation of these parts of the cortex constitutes, in fact, the terminal part of a voluntary act, so far as it had to do with the cortex. The precise mode of ideally-revived activity here and in other sensory centres gives rise to correspondingly precise stimuli, which, passing downward to the true motor centres, constitutes the volitional incitations for the desired movement.

The activities of these different word-centres are almost never called into play singly; for the most part, two or three of them are roused through commissural fibres almost simultaneously, though really in rapid succession. Thus, we think in words, whether the result is to be silent thought, speech, or writing. In the first case the activity is mainly in the auditory centre, though diffused to some extent in two directions—that is, toward the glosso-kinæsthetic and the visual word-centre. If the thought is to issue in speech the stimulus in the former direction is much the more powerful, and the conjoined activity of the two centres suffices to rouse the motor centres for speech. If, on the other hand, the thought is to issue in writing, the activity of the auditory centre is immediately followed by a powerful action in the visual word-centre, and this again by activity in the cheiro-kinæsthetic word-centre, whence volitional stimuli issue for the production of writing movements. There appears always to be a prior activity in the visual or auditory word-centres, before the two kinæsthetic centres are called into activity.

In the examination of all cases of speech-defect we have to test in a systematic manner the integrity of these different word-centres, of the commissures which unite them, of the internuncial fibres issuing from the cortex, and of the true motor centres in the bulb. (a) If the patient understands what is said to him, and can repeat words which he has just heard pronounced, it shows that the auditory and glosso-kinæsthetic centres, with the commissure between them, as well as the outgoing channels and the corresponding motor centres, are free from serious damage; (b) If the patient can understand written speech, and can copy a word which has been written before him, it shows that the visual and cheiro-kinæsthetic centres, with the commissure between them, as well as the outgoing channels and the corresponding motor centres, are free from serious damage; (c) If the patient can read aloud or name objects at sight, it shows that the visuo-auditory commissure must be intact; (d) If the patient can write from dictation, it shows that the audito-visual commissure must be undamaged.

The author doubts the existence of any "centre for conception of ideas." He believes that the supposed necessity for assuming the existence of any such centre may be obviated by a fuller recognition of the different degrees of excitability of the auditory word-centre, and by the fact that when its excitability is lowered to different degrees, very different kinds of speech-defect are produced. Thus, where there is a slight lowering of the functional activity of the auditory centre we have a slight amnesia, with forgetfulness of names of persons and things; where the defect is graver the power of spontaneous speech may be nearly obliterated, though imitative speech may be retained and the

patient be able to read aloud fluently—*i. e.*, the auditory centre is only capable of reacting on receipt of a strong external stimulus, or of one coming to it from the visual word-centre; whilst, finally, if the auditory word-centre is entirely destroyed, there is entire word-deafness with complete aphasia.

He then reports a case in which there was lowered excitability of the auditory word-centre, preventing any other than the smallest amount of spontaneous speech, together with some aphemic difficulty in the mere utterance of words; though the main and most interesting defect was due to a lesion severing the two commissures between the auditory and visual word-centres. The patient could, namely, understand perfectly all that was said to him, or all that he read, but could neither write nor speak spontaneously, except to a very limited extent. He could, however, repeat words spoken to him, or copy those written. Moreover, (1) he could not name at sight or read aloud a single letter, nor (2) could he write a single letter from dictation. These two symptoms show that the two commissures between the visual and auditory word-centres had been damaged in some part of their course.

Finally, the author defines the various forms of speech-defects. In *aphemia* the patient can write freely. The condition may be incomplete, and then the utterance is more or less blurred or indistinct; or it may be complete, and then he is absolutely dumb. Here the lesion is not of the cortex, but of some part of the internuncial fibres as they pass downward from the third frontal convolution to the motor centres of the bulb. In *aphasia* the power of speech and writing are generally nearly lost, and there is usually some interference with thought. As regards the seat of the lesion in simple aphasia, he claims that the localization of Broca is clearly inadequate, and that there is absolutely no clinical difference between the aphasia produced by a lesion in the posterior part of the third frontal convolution and that which may be produced by a lesion in any part of the commissure connecting it with the auditory word-centre. Where a destructive lesion involves the auditory word-centre there is *word-deafness with aphasia*. Such a patient's mental condition is profoundly altered; he can neither speak nor understand speech, and, since words are first and principally revived in the auditory word-centre, thought in words is no longer possible; and since the revival of words in the visual centre could not be reinforced by their revival in the auditory centre, the comprehension or use of printed or written words no longer exists. In *commissural amnesia* the commissures are damaged between the auditory and visual word-centres, and the patient is consequently no longer able to name and read at sight, or to write from dictation. A lesion in the visual word-centre gives rise to *word-blindness with agraphia*. The patient may be quite unable to understand either written or printed language, but can comprehend spoken language, and can both think and speak. In *agraphia* the patient can speak and read, but cannot write. There is little or no interference with thought. The lesion is one of the cheiro-kinæsthetic centre situated in the posterior extremity of the second left frontal convolution, but a damage to any part of the commissure connecting this with the visual word-centre would produce exactly the same defect, since the stimulus must pass from the latter to the former centre.

The author does not countenance the division of aphasia into "motor" and "sensory." The defects are in all cases in the sensory centres, or in the com-

missures between them; excepting in the case of aphemia, where, as stated, it is in the internuncial fibres passing from the third frontal convolution to the motor centres in the bulb. The fact that a paralytic disability is produced does not in any way prove that it is not due to a defect in a sensory centre, or in a commissure between two such centres; it is here, in fact, that we have to look for the sources of the volition.

STUDIES ON ULCUS VENTRICULI SIMPLEX, GASTROMALACIA, AND ILEUS.

TALMA (*Zeitschr. f. klin. Med.*, 1890, xvii. 10) reviews briefly some of the various views which have been held regarding the mode of origin of ulcer of the stomach and of gastromalacia, showing that even yet little definite knowledge is possessed regarding it, and that the majority of writers consider that gastromalacia never occurs before death.

The author has undertaken a series of experiments upon animals with reference to this subject and to the relation of these lesions to ileus. These he reports in detail. The procedure followed consisted in the ligation of various parts of the intestinal tract; sometimes of the œsophagus and duodenum, sometimes of the duodenum alone or of some other part of the large or small intestine, sometimes in the separation of a loop of small intestine by a double ligation. Great swelling of the abdomen resulted in nearly every instance; due almost always to accumulation of fluid above the ligature. Gas was found in some cases, partly the result of the swallowing of air, partly due to fermentation. Investigations showed that these fluid contents of the intestinal tract consisted chiefly of the gastric secretion. The amount of hydrochloric acid poured out after the ligation of the duodenum appeared to be abnormally great. If the ligature was lower in the intestine, the secretion of the intestinal glands was also present, but it is uncertain what proportion of the fluid this formed. The nature of the fluid poured out by the intestine, and the character of the lesions seen both above and below the point of ligation seemed to depend largely upon the character of the gastric and intestinal contents at the time the experiment was made. Whatever the correct explanation may be, it is certain that very grave alterations often develop in the portion of the intestine below the ligature.

The results of closure of the large intestine were somewhat different from those just described. The animals lived longer, the distention of the abdomen was not so marked, and the fluid had accumulated in the large intestine, leaving the small intestine and stomach entirely empty. The marked power of the large intestine to absorb water was doubtless the reason that no more fluid was present. Fæcal changes take place in the substances blocked up in either the large or small intestine, but not in a loop of the bowel which has been cut off by a double ligature. From this the author concludes that the change is either due to ferments introduced with the food, or that it can take place only in ingesta which have undergone a certain degree of alteration. The production of the faecal character took place first in the portion of the contents nearest to the ligature.

The curative influence of vomiting was seen in the fact that rabbits, which do not vomit, died quickly through overfilling of the stomach, while dogs lived several days, because they do vomit. The practical deduction from this is that patients with ileus, who vomit with not too great labor, should frequently

have administered to them large amounts of warm water, combined with the employment of other uninjurious means of inducing vomiting. In nearly all the rabbits experimented on there was a profuse secretion of mucus. The object of this was clearly to protect the delicate glandular tissue from injurious influences. The cause of death in his experiments appeared to be nearly always the absorption of material from the intestine poisoning the economy.

The studies of the author lead him to the following conclusions more directly bearing upon the nature and cause of gastromalacia and ulcer of the stomach. He claims that gastromalacia develops under two circumstances: 1, the presence of chemically-altered gastric contents; 2, a high tension of the stomach wall. As a result of the latter there are produced in the gastric wall, especially in the mucosa, widespread hæmorrhagic infiltrations, necrosis, etc. Gastric contents, containing even a very small amount of hydrochloric acid, produce changes in the soft parts. The stronger the chemical action of the secretion the more rapidly do infiltration and necrosis and also the softening follow. Gastromalacia, as seen in rabbits experimented on, occurs principally in the fundus, since the resistance of the muscular wall to the pressure is least here, and the circulation is most interfered with; the interference with the circulation is the chief cause of hæmorrhages, etc. The great stretching of the wall of the fundus, and probably of the bloodvessels contained in it, is the reason that the gastromalacia is found only in this region. Probably the less degree of resistance of the mucosa in this part is not without influence. The malacia is denominated "white" when it develops without previous hæmorrhage.

In addition to the malacia, ulcers in various stages of development are found. These are due to extreme restriction of the circulation. Through this restriction there can either arise: 1. Large hæmorrhages under the mucosa, separating it from the muscular layer and causing its death; or, 2. Hæmorrhages into the mucosa, likewise producing its necrosis. As a result of softening of the necrotic parts under the influence of the gastric secretion, larger or smaller ulcers are produced.

Often, however, ulcers arise without previous hæmorrhage; and these are to be regarded as the result of softening.

The deductions from these experiments and from the nature of the isolated cases which have been reported lead the author to the conclusion that the brown gastromalacia arises in man usually, if not always, during life; though death may so rapidly follow that there is no time for the development of secondary inflammations and the like. Autopsies show that malacia in man is situated nearly invariably in the fundus.

With regard more particularly to the production of *ulcus ventriculi* in men, the author reports several cases in which painful tonic spasmodic contraction of the stomach wall—not the intermittent peristaltic contraction—was almost certainly the cause of ulceration and hæmorrhage; and he further refers to the frequency with which spasm of the stomach is witnessed in hysterical women, diseases of the central nervous system, and hypersecretion of the gastric juice.

Experiments were then made on animals to determine the cause and nature of this gastric spasm; and these appeared to prove that irritation of the left vagus developed a powerful contraction of the stomach, which, if long-continued, would produce round ulcer of the stomach, penetrating

the mucosa, and sometimes the muscular layer. It seemed, in fine, proven that the contraction of the wall of the stomach in the pyloric region was soon followed by necrosis of the mucosa, and this by the development of an ulcer. The pressure upon the bloodvessels, and especially upon the arteries, must come into play here, for, if the movement of the blood in the veins were disturbed more than that in the arteries, hæmorrhages would be found in various portions. The occurrence of hæmorrhages shows, however, that the veins do not entirely escape the pressure of the muscular layer. The great likeness between the symptoms after which, and the place where, ulcer of the stomach appears in both the rabbits experimented on and in man, justifies the conclusion that the genesis of both is the same; and that ulceration and hæmorrhage occurring in men after gastric spasm are the result of arterial anæmia produced by the pressure of the contracting muscular layer of the stomach. When hypersecretion of hydrochloric acid and gastric spasm occur together the conditions are those most fitting for the production of ulcer. The author believes that an excess of hydrochloric acid is often the cause of gastric spasm; but that it is not always the cause is shown by the fact that the administration of large amounts of fluid with carbonate of soda does not always prevent the attacks, and sometimes even seems to increase them. Nor does he claim that every case of ulcer is due to gastric spasm, though very many instances can be explained in no other way. That the ulcers occur almost always in the pyloric region is due to the fact that the muscular contraction is strongest here. When the contraction of the walls of the fundus is unusually strong, ulcers may occur there also.

The condition of the ulcers after once formed is still an undecided question. It has generally been claimed that they showed no tendency to heal, and that they may last for even twenty years or more. The author is, however, inclined to the view that the instances of vomiting of blood after long intervals of freedom from it are simply instances of the formation of new ulcers under the influences of the old causes, the old ulcers having healed. He thinks it improbable, if not impossible, that the functions of the stomach could continue normal between the attacks, if the ulcer were still existing.

SURGERY.

UNDER THE CHARGE OF

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GLUCK'S METHOD OF INSERTING IVORY JOINTS AS A SUBSTITUTE FOR EXCISED ONES.

DR. GLUCK's claim (*British Medical Journal*, No. 1550) to be able to implant pieces of bone and even whole joints, has naturally excited not only

attention but also much sceptical criticism. We saw, at the recent Berlin Congress, his articulated skeleton with bones patched with ivory and articulations replaced by an ingenious joint of the same material; but it was generally regarded as a curiosity rather than as of practical surgical interest. When a patient was shown, however, with a knee-joint capable of motion through a range of forty-five degrees, more interest was manifested, and Prof. Gluck's explanation of his methods was listened to with marked respect. He uses perforated spindle-shaped plugs of ivory, both ends imbedded in the central portions of the bones which it is proposed to unite. A modification of the method enables him to insert the false joint in suitable cases. There can be no doubt of his ability to secure at least temporary union of the soft parts over these ivory plugs, but the ultimate fate of the latter is more problematical. The possibilities are summed up as follows:

1. They may possibly remain there imbedded in the tissues, and, like pieces of metal, bullets, etc., give rise to no further trouble. Should such be the case with a joint, it is clear that, even if the patient walked well at first, owing to the plugs being sufficiently firmly united to the living bone to permit of it, the joint must after a while wear out, become broken and require to be repaired, thus necessitating a second operation. It is, however, extremely unlikely that any such result would occur. Pathology and practical experience have both taught us that bone or ivory, when it is employed for the union of bony parts, only plays a temporary part in their restoration, and is, after a time, longer or shorter as the case may be, completely absorbed. Gluck's own case, just mentioned, shows how rapidly such absorption can take place; in fourteen weeks after he had completed his operation on the humerus the bone which was extracted was much eroded all over its surface. If a joint is to be inserted which would be capable of performing its functions for any length of time, it must be constructed of metal or of some material which will resist those powers of absorption which are the property of all animal tissues.

2. These introduced pieces of ivory may prove a source of so much irritation that the animal tissues will not erode them, and they will then speedily become loosened from their surroundings and form a sequestrum, which if not removed will only remain as a source of irritation, and will, after some slight injury, give rise to suppuration and make its own exit *volens volens*. This is practically what would have happened in Gluck's myeloid sarcoma of the humerus case had the ivory plug not been removed by the Professor as soon as it had ceased to be fixed to the surrounding tissues.

3. The irritation of the foreign body will set up an overgrowth of bone in the neighborhood, and thus a joint which is at first movable will, provided much periosteum remains near it, be slowly enveloped in new bone-formation, and have its power of movement gradually checked and eventually brought to a complete standstill by the masses of bone which, advancing from both of the long bones to which it is attached, will at length produce a stiff joint and inclose the ivory apparatus. Complete absorption or necrosis of the ivory joint will then only be a matter of time.

Thus it would seem that surgery can hope for but little aid in this plan of treatment, except in so far as it aids us in promoting the union of bones, or

in preserving temporarily the length of a limb of which considerable portions of bone have been destroyed, thus giving time for the periosteum that remains to supply a new bone equal in dimensions to the one that has been removed.

We shall await with interest the future history of the cases on which Gluck has tried his ingenious plan of bone-implantation, and we shall indeed be surprised if any useful improvement remains three years after the insertion of their ivory joints.

THE TREATMENT OF TUBERCULAR ARTHRITIS AND ABSCESSSES BY IODOFORM INJECTIONS.

Since, according to BRUNS (*Arch. für klin. Chirurg.*, Bd. xl. Hest 4), the antitubercular power of iodoform is established beyond all cavil, the treatment of cold abscesses and white swellings by this drug should, when the latter is brought in direct contact with the diseased foci, yield satisfactory results. It is true that the treatment of open ulcers by iodoform applications has been disappointing, but this is readily explained by the fact that the constant secretion washes away the medication. When the diseased granulations are thoroughly removed by curetting or the use of the knife, there are few who will not grant that the free use of iodoform has a very positive and powerful action in preventing recidivity. In cold abscesses the most favorable conditions are offered for the action of an antitubercular medicament. There is here a closed cavity with walls made up of tubercular granulations and encapsulated from the surrounding healthy tissues by a fibrous investment. Iodoform injected into this cavity is brought intimately in relation with all parts of its lining membranes and remains in close contact for weeks. The effects of this treatment are rarely manifested for weeks or even months, then the abscess gradually diminishes in size, and finally disappears entirely. The length of time required to accomplish cure is frequently a cause of failure, since the surgeon, losing faith in this treatment, is prone to abandon it for some other before it has been fairly tried. In large abscesses a decided diminution in size can rarely be expected before one or two months, and complete cure is most exceptional before two to four months. The ultimate result is, however, so well assured that a favorable prognosis can be confidently made even when the patient is compelled to be up and about. In the last five years Bruns has treated upward of a hundred cold abscesses by means of iodoform injection, and 80 per cent. have been cured. This result is in strict accord with the reports of Billroth and Verneuil, and the combined cases are so numerous as to constitute an absolute proof as to the antitubercular power of iodoform. Olive oil was used as an excipient, the drug being added in the proportion of one to ten. Since it has been claimed that recidivity is common after apparent cure by this method, the cases treated two or three years ago were again examined; in all the cure was lasting.

Results such as these would strongly commend the treatment of tubercular empyema in the same manner. The author has had but slight opportunity of testing the treatment; in one case, however, the pleural exudate was in several months diminished one-third, while the body-weight was increased one-fourth.

In the last four years over fifty cases of tubercular joint affections were treated by the iodoform injections. Apparently permanent cures followed in many instances, and Wendelstadt and Krouse report similar results.

For these injections a ten or twenty per cent. mixture of iodoform and olive oil, freshly prepared and sterile, should be employed. This is never followed by sufficient absorption to occasion toxic symptoms. When the disease takes the form of parenchymatous synovitis with marked fungous outgrowth, the injection is carried into the joint cavity and into the fungous masses by means of several punctures, from two to six cubic centimetres of the mixture being forcibly driven in. When there is effusion into the joint, or abscesses have been formed, after puncture and evacuation, a quantity of the mixture sufficient moderately to fill the cavity is injected, from ten to thirty cubic centimetres frequently being required. There is but slight reaction following this treatment, and fixation of the joint is not necessary. Parenchymatous injections are repeated at intervals of eight days; when cavities are treated two to four weeks should elapse between each injection. Pain frequently disappears in a few weeks, but improvement in other respects is a matter of considerable time. The motion of the joint is often completely restored. More than half the cases thus treated may be expected to recover.

INTESTINAL ANASTOMOSIS.

T. B. ROBINSON (*The North American Practitioner*, vol. ii. No. 10, p. 451) describes a new plate for intestinal anastomosis. The only objection to the decalcified perforated bone disks of Senn is the length of time required to make them. He criticises the catgut ring of Abbe and the catgut mat of Davis because they do not coapt enough serous matter; they yield and become macerated; they do not keep the bi-mucous fistula patent; and do not produce sufficient fixation and consequent mechanical and physiological rest to insure healing. The segmented rubber ring of Brokaw is objected to for similar reasons. The plate which the author has used most successfully in a large number of experiments on dogs is a combination of a ring of catgut fastened to a plate made of two pieces of rubber. The two pieces of rubber are stitched together at each end with catgut, and the ring is sutured to the sides of the rubber plate with catgut sutures. The needle-armed sutures of the catgut ring are inserted through holes cut in the rubber plate. A triangular piece is removed from each approximating edge of the segments composing the plate in order to permit of faecal circulation. The author claims for this plate that it is successful in practical experiments; it is quickly made; it coapts the largest possible serous surface and holds in continuous approximation as long as desired the intestinal walls; it is readily absorbable and easily discharged.

A NEW INTESTINAL CLAMP.

BROKAW (*St. Louis Med. and Surg. Journ.*, vol. lix. No. 4, p. 201) describes a new clamp which he has devised for occluding the lumen of the intestine during operations. He has found the other clamps and devices for this purpose unsatisfactory.

The clamp can be made as follows: A piece of No. 12 copper wire, six or eight inches long, is covered with a piece of drainage tubing by forcing the wire through its lumen. The rubber is left to overlap and its ends are ligated. The rubber-covered wire is now evenly flexed upon itself, until it presents two perfectly parallel blades of equal length, and the completed clamp is ready for use. When the clamp is applied, one blade is pushed through the mesentery within a short distance from the attached surface of the intestine. The ends of the clamp are pressed together sufficiently to compress the gut, and a ligature is thrown around the extremities of the blades. Brokaw has had a similar instrument, with more mechanical finish, constructed by an instrument-maker. The advantages which he claims for his clamp are: simplicity of mechanism and ease of application; uniform compression of the bowel; precise regulation of the amount of compression; readiness with which the parts are separated and sterilized.

GUNSHOT WOUND OF IMPORTANT ABDOMINAL VISCERA.

J. T. URIE (*Boston Medical and Surgical Journal*, vol. cxxiii., No. 14, p. 318) reports a case of gunshot wound of important abdominal viscera with recovery. The patient was a soldier who was shot at rifle-practice. A 45-calibre conical rifle-ball entered the body about two inches to the right of the spine of the twelfth dorsal vertebra, and made its exit in the right hypochondrium, four and three-quarters inches from the median line, and passing in an oblique course between the ninth and tenth ribs. The injury was followed by great pain, but little or no evidence of shock.

No operation or exploration—beyond a futile attempt at probing—was attempted; the expectant plan of treatment being adopted.

There was hæmaturia for nine days after the receipt of the injury; and jaundice appeared between the fourth and fifth days. There was not at any time much abdominal tenderness beyond the site of the wound. There does not appear to have been any general peritonitis.

On the twenty-third day of the illness the patient was seized with a severe attack of pain, referred at first to the epigastrium, and later to the back. Nausea and vomiting followed, and about one pint of partially-changed blood was ejected from the stomach.

The patient ultimately made a perfect recovery. The liver and kidney were undoubtedly wounded in this case. The treatment consisted of morphine and stimulants.

DIVERTICULUM OF THE MALE URETHRA.

DITTEL (*Wien. Klin. Wochenschrift*, 3 Jharg., No 32) reports an instance of this rare anomaly, so rare that Kaufmann was able to collect but eight cases after a careful study of the literature of the subject. In the reported instance the diverticulum was not discovered till the patient had passed middle life; then a tight stricture was followed by the development of a fluctuating tumor the size of a child's fist located on the under surface of the penis. Concentric pressure on this tumor caused the escape of foul, purulent urine from the meatus. In addition, when the patient entered the hospital, the ordi-

nary signs of urinary infiltration were found. Three incisions were made, and the tumor before discovered was found to be a sac lined with mucous membrane, and communicating with the urethra by a comparatively small opening. Microscopic examination showed that this cavity was not a retention-cyst, while the microscopic appearances entirely precluded the possibility of its being an exaggeration of the dilatation commonly observed behind strictures. The fistula resulting from the incision was closed by a repeated plastic operation. Nearly all the cases observed have been found in the persons of young patients, the abnormality probably depending upon the fact that the peripheral and central parts of the urethra have, in their foetal development, not united before urine is forced into the central part.

LIGATION OF THE VERTEBRAL ARTERY FOR EPILEPSY.

The notes of a case of epilepsy in which the vertebral artery was tied are communicated by TELFORD SMITH (*The Journal of Mental Science*, vol. clv., New Series, No. 119, p. 518).

The patient was a congenital imbecile, eleven years old, who had from twenty to thirty fits per month. In 1881 the left vertebral artery was tied by Dr. Wm. Alexander. The operation was followed by arrest of the epilepsy and marked mental improvement under training. This improvement lasted four years, after which the fits returned, and his mental state steadily deteriorated; until in 1890 he became a hopeless epileptic idiot.

Ligature of the vertebral arteries for epilepsy has been performed by Dr. Alexander with the expectation that the diminution of the blood-supply to the brain and spinal cord would be more permanent than after ligation of other vessels, on account of the absence of anastomosing branches, and the restraints to dilatation of the unligatured vessels by the bony canals through which the cerebral vessels pass. On account of the uncertainty of cure, however, Dr. Alexander has ceased to perform this operation.

A CASE OF PERFORATING GUNSHOT WOUND OF THE CHEST AND OF THE WRIST-JOINT.

The results of antiseptic surgery as applied in military practice are well shown in the case reported by THOMSON (*Indian Medical Gazette*, vol. xxv., No. 9). The patient was wounded by balls fired from a carbine at short range. One bullet entered the chest on the left side, at the level of the ninth rib below the angle of the scapula, and made its exit one inch below the left clavicle, and three inches from the left clavicular notch. Beyond shock and slight dyspnoea, traumatopnoea was the only sign of lung wound present. The second ball traversed the left wrist-joint. Both wounds were carefully washed with 1:5000 perchloride of mercury solution, were syringed with one per cent. tincture of iodine lotion, and, after the removal of all foreign bodies, were dressed antiseptically. Beyond dulness and bronchial breathing noticeable for a few days over the middle portion of the left lung in front and behind, recovery, in so far as the chest-wound was concerned, was uninterrupted. At no time was there any hæmoptysis, or even a tinge of blood in the sputum. There was sloughing in the wrist-wound, which finally healed by granula-

tion and cicatrization. Six months later the patient returned to duty able-bodied in every way, and with good motion of the wrist-joint.

THE ULTIMATE RESULTS OF THE TREATMENT OF GOITRE BY LIGATURE OF THE THYROID ARTERIES.

The histories of twenty-one cases of goitre treated by ligature of the thyroid arteries, together with deductions drawn from personal experience and a careful study of the literature of the subject, are communicated by RYDYGIER (*Archiv für klin. Chirur.*, Bd. xl., Hft. 4). The majority of these cases were operated on in 1887 and 1888, so that sufficient time has elapsed to speak some authority upon the final results. In all except the first case the two inferior and the two superior arteries were tied at one sitting, two ligatures being applied to each vessel, and the latter being divided between these threads. The fear, at one time entertained, that gangrene might follow this interference with the blood-supply of the thyroid, has been abundantly proved to be groundless, the crico-thyroid arteries and the vessels of the œsophagus providing a sufficient supply to maintain the vitality of the part. The fear has also been entertained that ligation of all the arteries would be followed by the same systemic changes observed after total extirpation of the thyroid; as a matter of clinical fact, this result has not been observed, nor should it be expected, since it is found that the gland never disappears entirely. Simultaneous ligation of the four thyroid arteries is, however, not to be recommended in all cases. Thus in the fibrous goitre, this method is necessarily abortive, for cure is effected by the replacement of the parenchyma of the enlarged gland by fibrous tissue, which, in the course of its cicatricial contraction brings about disappearance of the enlargement; hence, when the tumor already consists of cicatricial tissue, cutting off of the blood-supply can be of little service. Also in the case of cystic goitre no good effect can be hoped from ligation of the arteries; indeed, when this method of treatment is adopted in struma gelatinica, it seems at times to favor the development of cysts.

In colloid goitre a treatment by ligature is followed by distinct alleviation of the subjective symptoms. Tumors of great size are diminished only slightly, smaller tumors show much more marked improvement. This is probably because in recent cases, where the enlargement is not great, there is a large amount of unaltered gland tissue remaining. It is the disappearance of this which occasions the diminution in the size of the growth.

The best results follow this treatment when it is applied to moderately large, recent, parenchymatous goitres, where the glandular structure is little altered; these rapidly diminish in size after ligature of the supplying vessels, especially where the tumor is markedly vascular, and frequently the neck becomes entirely normal in appearance.

TWO CASES OF RECURRING CARCINOMA OF THE GENITALIA.

HERZFELD (*Wien, klin. Woch.*, 3 Jahr., No. 32) holds that total extirpation of the uterus, either by abdominal incision or through the vagina, is not indicated in cases of carcinoma of the vaginal portion of the cervix uteri,

since other means, such as amputation, curetting, and the use of caustics or the actual cautery, give practically as favorable a prognosis and are not attended by as great danger to the life of the patient. It is well known that lasting cures have followed each of these milder methods of treatment; thus the author mentions having seen a case which had remained free from return of disease for twenty-nine years after amputation of the cervix for carcinoma. Two cases are reported in full. In the first, on account of cancer of the vaginal portion of the cervix, amputation by means of the galvano-cautery was practised in 1879. In 1889 the patient returned with a slight carcinomatous development about the meatus urinarius; the site of the former operation remained entirely healthy. The second case was operated upon, in 1884, for epithelioma involving the clitoris; the thermo-cautery was used. Five years later a small epitheliomatous nodule began to develop upon the right labium majus. This also was excised.

OTOLOGY.

UNDER THE CHARGE OF

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"UNRECOGNIZED LESIONS OF THE LABYRINTH."

Such is the title of the Cavendish Lecture, delivered before the West London Medico-Chirurgical Society, June 6, 1890, by Dr. Alexander Ogston, of the University of Aberdeen (*The Medical Press*, June 18, 1890). Effusion into the labyrinth is first considered. Reference is here made to certain affections of the labyrinth, presenting symptoms somewhat similar to Ménière's disease, but of a different character and less striking in their features, and "possibly nearly always overlooked or misinterpreted." Among elderly or gouty subjects known to possess gouty or chronic rheumatic tendencies, or in those in whom it is fair to suppose that such conditions exist, there may be found attacks of what are termed "serous effusion into the labyrinth, with increased intra-labyrinthine pressure, a process analogous to glaucoma of the eyeball." The patient observes "that some morning, without any observable cause, he suffers from the feeling of tension in his ear." This sensation of distention and discomfort usually rapidly increases during the first six or eight hours, and is attended with great distress and anxiety. It will also be found that the patient is deaf in the affected ear, and has tinnitus. It will be found that the hearing for a watch normally audible at twenty-five feet is now audible only two feet. The voice is relatively better heard.

"This deafness gives rise to a singular phenomenon in the region of the external auditory meatus. When, in a normal ear, the finger is brought in contact with the skin around the meatus, the individual both feels and hears

the contact. If the deafness described is present, the contact of the finger is felt as usual, but is not so distinctly heard, and hence, for three-quarters of an inch in front of and below the meatus, and over nearly the whole pinna, when the finger is rubbed gently so as to stir the fine hairs and the skin, the patient feels as if the part touched were benumbed in marked contrast to the sound ear, where the usual familiar sensation is perceived." However, as the author states, this phenomenon is observed "in any condition of the ear which interferes with the conduction of sound to the internal ear." It cannot, therefore, be accepted as pathognomonic of effusion into the labyrinth.

Then follows a description of the various forms of tinnitus aurium and hyperæsthesia of the hearing-sense observed in the cases named above in the title, but which correspond exactly with the phenomena observed in every case of acute catarrhal congestion or inflammation of the middle ear. It is not accurate nor tenable, therefore, to classify such cases as simply "effusion into the labyrinth." Were there the latter condition the deafness must be profounder and permanent.

The author holds that the drum-cavity becomes affected secondarily, the disease "probably passing outward through the *fenestra ovalis* and the *fenestra rotunda*," a state of things not ever seen in this country, so far as the knowledge and experience of your reporter go.

The "variable severity" of the attacks corresponds entirely and exactly with the forms of acute catarrhal swelling and inflammation in the tympanic cavity, varying from the severe and distressing, to those that attract very little attention.

Then the course of the disease, as described, is exactly that of progressive, catarrhal deafness; very well described, but attributed to wrong causes. In many cases there is a loss of balancing power, just as there is in cases of so-called chronic catarrh of the middle ear. There is said to be a permanent deafness to shrill faint sounds from the first attack. There is nothing offered by the author to elucidate the pathology of the disease to which he has given a new name, because no cases have died of it, and hence he has made no dissections. We recognize all the way through the article a familiar foe with only a new name. Effusion of the labyrinth may occur secondarily in cases of tympanic inflammation, but the latter condition is the frequent and primary one.

The treatment found most efficacious by the author is, first, rest in bed, and then protection of the ear from loud sounds. As the patient gets better he may walk about, but avoid all severe exercise and fatigue, and also loud sounds and noise.

The author also claims "that the field of hearing of a normal ear has its limits in lateral directions, and that points of greater or less acuteness exist in it. If a person be seated with his ear horizontally directed toward a watch or other source of sound, and at such a distance from it that he can just distinctly perceive it, it will be found that as he inclines his head in various directions, the sound becomes more or less distinct, and at certain limits of inclination inaudible."

TREATMENT OF SCLEROTIC DISEASE OF THE MIDDLE EAR.

In an article on the above-named topic Dr. Löwenberg, of Paris, records the following observation made by him in the inflation of fumes of bromethyl into the middle ear for the relief of tinnitus (*Deutsche med. Wochenschrift*, July 10, 1890). After stating that this drug has rendered the tinnitus less in many cases, he states that "if the vapors of ether, chloroform, or bromethyl be inflated into the middle ears of those not suffering from sclerosis of the middle ear, a sensation of coldness in the ear is felt, whereas the same vapors inflated into the ear of one affected with sclerosis of the drum-cavity produce a sense of heat." This may be considered a valuable aid in differential diagnosis and in prognosis.

A CONTRIBUTION TO THE STUDY OF INTRACRANIAL COMPLICATIONS OF CHRONIC OTITIS MEDIA.

An interesting and valuable article with this title has been contributed by R. GLASGOW PATTESON, M.D., etc., Surgeon to St. Vincent's Hospital, Dublin, in the *Dublin Journal of Medical Science*, July 1, 1890.

The case forming the subject of the paper was one of chronic middle-ear disease in a woman nineteen years old, who had suffered from otorrhœa in her left ear since she was three years old, when she had measles. Since that time the ear had been affected with discharge and deafness. Gradually the patient grew deafer, and at last suffered great pain in the left ear and side of the head, and showed dulness of intellect.

The symptoms became such as finally to demand trephining the mastoid. "The opening was made half an inch behind, and its lower border on a level with the lower edge of the external auditory meatus, but in trephining," says the writer, "I did not allow sufficiently for the small skull I had to deal with, nor did I direct the trephine sufficiently upward, and instead of opening the mastoid antrum I exposed the dura mater, as subsequent events showed, just behind the genu of the lateral sinus. No softening of the bone was found at this point, and the dura mater was perfectly healthy."

Thrombosis of the lateral sinus finally ensued and an extra-dural abscess with pyæmia. Then a secondary trephining and exploration of the temporal lobe of the brain were instituted, followed by death from embolic pneumonia.

It is worthy of note that in the evening following the operation the patient complained of a throbbing in the left side of the head, and of stiffness and pain in the neck, in the line of the sterno-cleido-mastoid muscle, much increased by the slightest effort of moving or even on being turned gently in bed. There was also an intense craving for food, great peevishness and irritability of temper. As Mr. Patteson says, this soreness and stiffness in the neck marked the extension of a septic thrombosis into the internal jugular vein. Coincident with this extension was the development of a short, troublesome cough, unaccompanied by expectoration, which began four days before the patient's death. This was due to the development of embolic pneumonia, "the commonest cause of death in thrombosis of the lateral sinus."

The variability in the course of the lateral sinus produced a complication in this case, as it wound forward and outward, as is the case in brachycephalic

skulls,¹ a point apparently unknown to the operator in this case. In the brachycephalic, the middle fossa of the skull is lower or deeper than in the dolichocephalic. In this instance disease of the lateral sinus was found associated with cerebral abscess and not with cerebellar abscess, as is generally the case.

There are many symptoms common to the initial stages of all varieties of complication to which subjects of old-standing disease of the middle ear are liable, "such as increased pain in the ear, tenderness over the mastoid process or along the sterno-mastoid muscle, general irritability and peevishness, foul tongue, associated with persistent nausea and vomiting, headache, which may be either frontal, parietal, or occipital, independent of the seat of the disease, occasionally diarrhœa, and a rise of temperature, which may be associated with rigors, and is perhaps the most frequent of all; these symptoms collectively, or any combination of them, may be present, thus affording but little aid to a differential diagnosis," as they all indicate "an acute, septic infection grafted on an ordinary saprogenic suppuration" (Barker), and are accordingly common to all. Among the symptoms usually regarded as being closely connected with intra-cranial lesions, *optic neuritis* is first named, but has been found entirely unreliable as a diagnostic guide. Much reliance cannot be placed upon *vomiting* as a symptom of differential value. Mr. Barker has called attention to "slow and sluggish cerebation" as a symptom of either cerebellar abscess or collections of pus in the temporo-sphenoidal lobe, while it is not a symptom of other complications of disease of the temporal bone.

The author then remarks that "in all cases of brain-abscess, no matter what their seat, the respiration is slow and shallow, but *regular*. If, however, a secondary basal meningitis has occurred, most markedly when the posterior fossa of the skull is affected, the slowness is associated with *irregularity* of breathing, and in several cases Cheyne-Stokes respiration has been noticed." But "the most reliable guide, in the majority of cases, seems to be the course of the *temperature*, and the association of repeated rigors with marked oscillations of temperature would appear to be the most constant symptom of sinus thrombosis."

Mr. A. E. Barker's types for each class of cases are then quoted as follows: *Pyæmia*. The temperature lines are of extreme irregularity and the oscillations frequent.

Meningitis. The temperature lines are not so irregular as in pyæmia, but often higher.

Cerebral abscess. The temperature lines are unusually low, often sub-normal, and do not show much oscillation. "In the majority of cases, however, we must depend upon the history of the case, the seat of the origin of the disease, and the steps of its progress, to enable us to arrive at any conclusion approaching definiteness; while in a very large proportion of cases nothing but an exploratory operation affords a chance of making a diagnosis or of saving the patient's life."

In speaking of treatment Mr. Patteson is of the deliberate opinion expressed "without fear of contradiction, that every case of otitis media which

¹ Kärner: Archives of Otolaryngology, vol. xvi. p. 281, Dec. 1887.

has not yielded to treatment by antiseptic injections, insufflations, etc., within a year from its beginning, should be treated by free opening of the mastoid antrum and the establishment thereby of thorough means of irrigation and drainage; and if that should not prove sufficient, by exposure of the dura mater both above the tympanum and in the neighborhood of the lateral sinus."

Treatment of thrombosis of the lateral sinus "by ligation of the internal jugular vein in the middle third of the neck so as to cut off from the general system the focus of septic dissemination," has been suggested by Mr. Victor Horsley. This form of treatment has been *successfully* carried out by Mr. Lane in Guy's Hospital, August, 1888, in a boy ten years old.

Mr. Ballance reported four cases in which the lateral sinus had been explored for septic thrombosis, and the jugular vein ligatured (Med. Soc. of London, March 31, 1890). The vein was divided between the two ligatures, and after as much of the clot as possible was removed, the upper part of the divided jugular was washed out from its distal extremity with an antiseptic solution. Two of the cases recovered.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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HAMAMELIS AND ALCOHOL IN THE TREATMENT OF NASAL POLYPI.

In an article on the Treatment for the Radical Cure of Polypi of the Nose (*Med. Record*, June 18, 1890) DR. E. HARRISON GRIFFIN recommends spraying the nose night and morning with sprays of witch hazel or of alcohol, at first dilute and gradually increased to full strength, for at least one year after thorough removal of the polyps with the wire snare. He reports a number of illustrative instances, in one of which he removed fully three hundred polypi at various sittings, and in another more than one hundred in the course of a week. Caustics and cautery after extirpation he finds to be almost invariably followed by renewed growths.

NASAL POLYPI.

DR. WALKER DOWNIE, of Glasgow, recently exhibited (*Brit. Med. Journ.*, September 13, 1890) several unusually large nasal polypi, three of which, from different individuals, were respectively two and one-half, two and three-quarters, and three and one-quarter inches in length. Another, which had occupied the post-nasal space, weighed a few grains short of half an ounce.

All had been removed with long-bladed lock-jointed forceps after cocainization. When closed upon the growth the forceps were left in position for two or three minutes, so as to crush the bloodvessels. Then, with a half or two-third rotation of the forceps the mass readily came away.

In the same number of the *Journal*, in an editorial on Nursing in the London Hospital, allusion is made to a death in the medical staff last year, and another in the nursing staff this year, from suppurative meningitis following the removal of polypus from the nose.

MEDICATED NASAL CYLINDERS IN THE TREATMENT OF HAY-FEVER, CATARRH, OZENA, NASAL DIPHTHERIA, ETC.

DR. SCANES SPICER, of London, uses (*Brit. Med. Journ.*, September 13, 1890) hollow glyco-gelatine cylinders variously medicated, which are inserted in hollow, oval vulcanite plugs. Each plug is provided for safety with a string anteriorly, which can be attached to a fellow plug when two are used, one in each passage. The process of liquefaction requires several hours, during which time the rhino-pharyngeal tract is continuously subjected to the action of the drug, and is soothed and moistened by the glyco-gelatine; and this without suspending nasal respiration. They are likewise used with advantage after operations in the nose, in post-nasal catarrh, and in whooping-cough.

ON NASAL OBSTRUCTION AND MOUTH-BREATHING AS FACTORS IN THE ETIOLOGY OF CARIES OF THE TEETH AND IN THE DEVELOPMENT OF THE VAULT OF THE PALATE.

This is a reprint of an address before the Odontological Society of Great Britain by SCANES SPICER. It is contended that obstructions to respiration by the nose and subsequent mouth-breathing lead to arrest in the growth of the vomer and the sinuses of the sphenoid bone; thus producing the highly-arched or vaulted palate, and lateral flattening of the upper jaw. The accumulations of organic matters in the irregularities of the teeth, unremoved by motions of the tongue, lips, and cheeks, and by the action of the saliva, produce the caries so frequently found in association with nasal obstructions. Hence, a plea for the simultaneous services of the rhinologist and the dentist.

Rhinologists generally are more apt to view the obstructions of the nasal passages, especially the deformities of the septum, as the result of deformations of the palate and maxillary bone and not as the cause. The arching of the palate, the anterior projection and lateral compression of the upper jaw-bone are usually, and we believe in most instances, correctly attributable to the habit of thumbsucking. Arrest of development of the septum will hardly account for deflections and exuberant spurs, which are rather indicative of supernutrition.

Spicer states that his hypothesis was suggested by the observations of John Hilton as to the part played by the vomer and the sphenoidal sinuses in the formation and position of the hard palate (*Developmental and Functional Relations of Certain Portions of the Cranium*, 1855).

DEFORMITIES AFTER ABSCESS OF THE SEPTUM NARIUM, AND AFTER FRACTURES OF THE NOSE.

In an article on abscess of the septum narium Dr. GOUGUENHEIM, of Paris (*Annales des Mal. de l'Or. du Lar.*, etc., September, 1890), reports three personal observations of this rare affection, two in a child, and the other one in an adult. In two of these there occurred a deformation of the nose just below the osseous framework, which, in one instance, occurred before the abscess was opened, and remained permanent. This deformity is theoretically accounted for in the probability that the abscess involved the posterior portion of the cartilaginous septum and produced a luxation backward from the perpendicular plate of the ethmoid or from the vomer. This opinion is based upon some experiments on the cadaver made by the late Dr. Daniel Mollière at Gouguenheim's suggestion, to test his theory of similar deformation in perforating ulcers from syphilis which, when seated in the anterior portion of the cartilaginous septum, do not produce this deformity. In consequence of his observation *post-mortem* in cases of fractures of the nose as well as from experiments on the cadaver, Mollière reached the conclusion that fracture of the nose is a luxation of the septum upon the vomer.

DEFLECTIONS OF THE SEPTUM NARIUM.

IN a recent discussion of this subject in the British Medical Association (*Brit. Med. Journ.*, September 13, 1890), the following points may be noted as of interest. DR. E. WOAKES, of London, who opened the subject, declared that in deviations and spurs of idiopathic origin, the cause would most frequently be found in the presence of enlargements of the spongy bone, whether due to hypertrophy, to neoplasms, to exostoses, or to cysts. In operations for removal of spurs, he had found that Rouge's exposure by detachment and eversion of the lips afforded very little additional room for interference. He removed the spur with a saw, and covered the wound with a small plug of wool dipped in carbolized vaseline, and sometimes dusted with iodoform. Any deviation requiring correction was rectified with an Adam's dilator, and the new position was maintained with two plugs made of firwood wool instead of some solid material, and which could be kept in position for a week.

MR. W. J. WALSHAM, of London, preferred shaving off exuberant portions of the deflected septum. When there was deviation of the maxillary crest, he fractured the crest and forced the upper fragment along with the attached cartilage into the median line and retained it there with suitable appliances until consolidation had taken place. In cases of general deviation of the whole septum to one side in conjunction with irregular spurs and localized bulgings, and combined with deflections of both the vomer and the maxillary crest, forcible straightening with excision of the most prominent spurs offered the best prospect of success. If this failed, the best course was to remove the inferior turbinated body and leave the septum alone. When the nasal bones were depressed so that the nose became broad, and the nasal processes of the maxillary bones separated, the bones could in many cases be lifted or wrenched into place with forceps. No untoward results, such as necrosis or other injury, had hitherto occurred in his practice, though if too

much force were used it might be possible to injure the cribriform plate of the ethmoid, and thus run the risk of septic meningitis.

DR. J. H. BOSWORTH, of New York, believes that deflections and spurs of the septum are responsible for the large majority of diseases of the nasal mucous membrane. He employs the saw to remove the spurs, not simply for the purpose of curing the stenosis, but in order that the turbinal bodies may perform their important normal functions. He considers that anything which interferes with the respiratory duty of the nose is likely to be followed by disease in other portions of the respiratory tract; and that therein is the origin of most diseases of the larynx, trachea, bronchi, and even the lungs. The restoration to healthy action of the turbinated bodies, and their intact conservation, are, therefore, of primary importance.

DR. WILLIAM HILL pointed out that the spurs ordinarily met with were only exaggerations of slight prominences normally existing along the vomeric sutures.

MR. LENNOX BROWNE explained that these slight septal thickenings were capable of becoming hypertrophied as the result of inflammation.

DR. GREVILLE MACDONALD emphasized the fact that a large proportion of individuals suffered from these and similar forms of nasal obstruction with absolute impunity. He urged the impossibility of straightening a deflected septum, seeing that it lay between fixed limits; he advocated the perforation of the convexity in preference to any crushing.

DR. SCANES SPICER suggested injury to the cartilaginous structures during parturition as a cause of slight displacements made evident later in life by palpable deflections.

REFLEX SPASM OF THE ŒSOPHAGUS.

JOAL, of Mont-Dore, reports (*Rev. de Lar. d'Otologie et de Rhin.*, August 15, 1890) a case of œsophageal spasm, due to hypertrophy of the so-called fourth tonsil, a mass of lymphoid hypertrophy in the base of the tongue. Last year he reported nine cases due to nasal and genital disorders.

[We have seen œsophagismus result from various pharyngeal diseases, especially chronic folliculous tonsillitis with accumulations of masses in the crypts; and likewise from aural irritation, due to accumulations of cerumen in the external auditory meatus. It is important that these facts be borne in mind in cases of recurrent œsophagismus and even in some cases of continuous stricture.—ED.]

INTUBATION WITHOUT THE GAG OR THE EXTRACTOR.

GUIDO BELL, of Indianapolis, finds (*Journ. Amer. Med. Association*, August 30, 1890) the gag and the extractor both superfluous in introducing and in withdrawing the tube. He simply passes his left index finger behind the root of the tongue, and then the larynx at once rises in the effort of gagging and meets the awaiting finger. At this moment he inserts the tube with the right hand, retains it in place with the left hand, and withdraws the introducer at once. In more than one hundred intubations after this method, he has not occupied more than three seconds. Dr. Bell states that there is no biting for a few seconds after the finger has been thrust into the

larynx; but that the finger had best be protected in front of the knuckle by a shield of adhesive plaster.

To withdraw the tube, he simply squeezes it up into the pharynx by grasping the larynx externally; and he hooks it from the mouth with his finger; thus discarding the extractor altogether. He has succeeded in removing the tube in this manner in five cases in which removal with the extractor had repeatedly failed.

QUINSY AT EIGHT MONTHS OF AGE.

LEWIS H. TAYLOR, of Wilkesbarre, reports (*University Med. Magazine*, August, 1890) an instance of acute tonsillitis in a female infant eight months of age, in which, after prolonged suffering and threatened asphyxia, immediate relief was secured by incision, giving egress to fully an ounce of fetid pus, which gushed out to a distance of nearly two feet.

SODIUM BISULPHITE IN EPIDEMIC TONSILLITIS AND CORYZA.

C. M. FENN, of San Diego, testifies (*University Med. Magazine*, August, 1890) to the prompt effect of this drug in aborting many cases of tonsillitis and coryza. He prescribes a saturated solution, and prefers the English preparation. He gives tablespoonful doses every hour or two for twelve hours, and then every three or four hours for twelve or twenty-four hours longer. He seldom finds it necessary to continue the remedy beyond forty-eight hours.

OBSTETRICS.

UNDER THE CHARGE OF

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CÆSAREAN AND PORRO OPERATIONS.

STOLIPINSKY (*Centralblatt für Gynäkologie*, No. 35, 1890), from experiments upon animals, concludes that compression by the rubber tube is the best method of preventing hæmorrhage; it should be applied as soon as the abdomen is opened, but should not be tightened until the uterus is empty. Martin's elastic bandage is a convenient form of compressor. The atony of the uterus often observed after the use of the compressor is caused by the fact that the uterus is empty of blood. Observations prove that the Cæsarean operation, including the use of the compressor ligature, is entirely harmless for the fœtus. The percentage of living children delivered without asphyxia when the compressor was applied after the delivery of the child or placenta

is considerably greater than when the compressor was applied while the child was still in the uterus.

MCGOWAN (*Lancet*, p. 1423, 1890) reports a case of osteo-malacia in which excessive pelvic deformity resulted. She had previously borne five children, and her pelvic deformity had developed in the six months preceding the time of operation. The patient had been forty-two hours in labor when first seen. She survived the usual Cæsarean section six days, dying from exhaustion and peritonitis.

DUDLEY (*American Journal of Obstetrics*, p. 712, 1890) reports a Cæsarean section in a dwarf, in which catgut was used to close the uterus and abdomen. The endometrium and an eighth of an inch of uterine tissue were included in an over-and-over stitch. A second row of similar sutures included the muscular wall, and a third row closed the upper muscular tissue and peritoneum. The time of the operation was one hour and twenty minutes. Hæmorrhage was controlled by the elastic ligature, the case resulting in uncomplicated recovery.

ADAM (*Australian Medical Journal*, No. 7, p. 300, 1890) reports a Porro operation in an imbecile dwarf with highly-contracted pelvis. It was necessary to turn the uterus completely out of the abdomen before the rubber ligature could be passed about the cervix. Uterine amputation was performed with the use of Tait's wire clamp. In addition, a couple of pins were passed through the stump, which was treated with perchloride of iron, and dressed with iodoform. Mother and child made satisfactory recovery.

THE RELATION BETWEEN OVULATION AND MENSTRUATION.

COHNSTEIN (*Deutsche Medicinische Wochenschrift*, No. 34, 1890) concludes that a relation of time and also cause and effect exists between these two phenomena. The cessation of ovulation is followed by the cessation of menstruation. Ovulation, however, may go on independently of menstruation, and the functional activity of the ovary may be estimated by its response to reflex stimulus. The ovaries probably alternate in their function. It is impossible to estimate definitely the age of any Graafian follicle.

THE TREATMENT OF ABNORMAL INSERTION OF THE PLACENTA.

PINARD (*L'Union Médicale*, No. 78, 1890) would treat abnormal insertion of the placenta by external version, performing cephalic version when the placenta is laterally inserted, and podalic version when it is central. For hæmorrhage he would rupture the membranes.

A STUDY OF THE BLOOD IN PREGNANCY AND THE PUERPERAL STATE WITH REFERENCE TO THE AMOUNT OF HÆMOGLOBIN.

DUDNER (*Münchener medicinische Wochenschrift*, Nos. 31 and 32, 1890) states that during pregnancy the percentage of hæmoglobin and corpuscles diminishes, but increases again under favorable conditions of life. Soon after delivery, hæmoglobin and corpuscles are lessened in proportion with the anemia of the patient. In the majority of cases, in eight days after labor

the percentage is increased to that of pregnancy. During active labor the percentage is lessened by cutaneous transpiration.

THE PATHOLOGY OF THE NEWBORN.

CHIPAULT (*Bulletins de la Société Anatomique de Paris*, 1890, p. 280) reports the case of a child dying two and one-half months after birth, whose mother suffered from puerperal infection. The child complained of multiple arthritis during life. Post-mortem examination revealed the right elbow and hip-joints extensively decomposed by osteomyelitis. Streptococci were found in abundance in many of the joints of the body. It seems a reasonable inference that the child became infected from the mother's puerperal sepsis.

VALENTA (*Wiener klinische Wochenschrift*, No. 35, 1890) regards aseptic prophylaxis as quite sufficient, in the majority of cases, to prevent ophthalmia neonatorum. Credé's treatment by nitrate of silver is too dangerous to be placed in the hands of nurses.

PAPTRIDGE (*New York Medical Record*, 1890, p. 210) reports an interesting case of multiple oozing of blood with excessive jaundice in a newborn child. Recovery ensued. In his observation in 1166 infants born at the Nursery and Child's Hospital, New York, 11 cases of hæmorrhage have occurred with a mortality of 75 per cent. At the Sloane Maternity Hospital, in 850 infants there have been 14 cases, mortality over 60 per cent. No intelligent family history of bleeding was obtained.

LABOR COMPLICATED BY UTERINE FIBRO-MYOMA.

CAMERON (*Montreal Medical Journal*, p. 91, 1890) reports a case of interstitial fibroid complicating pregnancy, in which, fifty hours after the beginning of labor, a dead child was spontaneously born. The head was very much compressed. After labor, the patient was seized with septic trouble apparently arising from the tumor, and laparotomy was performed, but the patient succumbed. Examination of the amputated uterus showed marked fatty degeneration without endometritis. The tumor contained multiple cavities filled with opaque fluid. No evidences of suppuration were found.

DOLÉRIS (*Journal de Médecine de Paris*, No. 37, 1890) reports a case of uterine fibroid upon the right side of the uterus, in which the patient had borne three living children without difficulty. The tumor and the uterine appendages were finally removed by operation, the patient making a good recovery. He also describes a case of tubal pregnancy complicated by uterine fibroid, in which abdominal section was done for sudden pain and syncope occurring early in pregnancy. At the operation, ruptured tubal pregnancy with uterine fibroid was found. The removal of the tumor and the appendages was followed by complete recovery.

ECTOPIC GESTATION.

LANDAU (*Berliner klinische Wochenschrift*, No. 35, 1890) reports a case of pregnancy in a rudimentary uterine cornu in which abdominal section was performed. The uterus was found smaller than is usual, and an examination of the tumor, which was removed with the appendage of that side, disclosed

a body shaped like the uterine body, with muscular walls, containing bloody fluid, and an adherent clot. The tumor connected with a muscular imperforate cord covered with peritoneum. On the left side of the tumor, the left ovary, tube, and broad ligament were found as normal. On the right side adhesions existed. The corpus luteum of pregnancy was found in the right tube. It is probable that not only was rudimentary pregnancy present in this case, but also migration of the ovum had occurred.

HAHN (*Berliner klinische Wochenschrift*, No. 30, 1890) removed a tubal pregnancy of six weeks. The usual symptoms, pain, hæmorrhage, and shock, indicated operation. The removal of the tumor and tube from the right side of the uterus caused immediate cessation of the symptoms.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

ALEXANDER'S OPERATION.

ALLOWAY (*Montreal Medical Journal*, April, 1890) reports twenty cases of this operation, the results of which had been most satisfactory. He believes that the operation is incomplete if any existing injury of the pelvic floor is not repaired at the same time; indeed, he advises the performance of trachelorrhaphy, perineorrhaphy, and shortening of the round ligaments at one sitting when the uterus is large and subinvolved. He aptly remarks that "to suspend a heavy, bulky uterus by the aid of the round ligaments over a prolapsed pelvic floor is unreasonable, and the bad result obtained will only tend to bring the round-ligament operation into discredit, and very unjustly so."

In regard to certain points in the technique of the operation, he differs from Polk, since he aims at securing healing of the inguinal wounds by first intention, using a special form of drainage-tube. The patient is caused to wear a double truss for a few months after the operation.

THE DIAGNOSIS OF SALPINGO-OÖPHORITIS.

MICHNOW (*Centralblatt für Gynäkologie*, No. 32, 1890) calls attention to the importance of obtaining some characteristic sign of this condition, in view of the frequent difficulty in diagnosis. Lebedeff has observed that after repeated examinations of patients with suspected tubal disease, he was able to demonstrate at one examination a well-marked enlargement of the tube upon one side, while at a subsequent one nothing could be felt but an ill-defined cord or induration: on palpating the same patient after an interval he would find that the condition was reversed, the distended tube having

collapsed so as to form a band or cord, while at the site of the induration on the opposite side there was an enlarged tube. It was found that at the beginning of menstruation the distended tube became larger, that toward the end of the period it diminished in size, and became completely collapsed after the cessation of the flow. The opposite tube may remain unchanged, or may gradually increase in size in inverse order. This increase in size is to be explained not only by the general periodical congestion of the pelvic organs, but also by the fact that the mucosa of the tube becomes swollen at this time, and a certain amount of blood may escape into its interior; moreover, there may be a fresh secretion of fluid into the tube. When a diseased ovary forms part of the tumor, the enlargement of Graafian vesicles, which still remain healthy, doubtless accounts for a certain amount of increase in its size during menstruation. This phenomenon is more clearly marked when the original tumor is of moderate size.

By carefully observing successive cases in which the pressure of salpingo-oöphoritis was doubtful, Lebedeff was able to arrive at a positive diagnosis, which was in each instance confirmed by laparotomy.

TUBERCULOUS ULCERATION OF THE PORTIO VAGINALIS.

HAIDENTHALLER (*Wiener klin. Wochenschrift*, No. 34, 1890) describes and figures a case of this rare affection, which possessed more than usual interest, since in all the other cases that have been reported the tubercles were of the miliary variety. The patient was twenty-nine years of age, and had borne three children, one of whom had died of tuberculosis of the intestines. Her father died of phthisis, and she had had a "catarrh" for several years. Three years and a half before coming under observation she had aborted at the second month, and suffered from metrorrhagia for eight months after, the hæmorrhage ceasing after curetting. Two months later she began to have a sanguineous discharge, which later became purulent and foul-smelling. She emaciated rapidly, and complained of pains in the abdomen with cramps in the lower limbs. On examination well-marked evidences of pulmonary trouble were found; the abdomen was tympanitic and so tender that thorough palpation was impossible. The urine, as well as the sputum, contained tubercle bacilli. Vaginal examination showed that the uterus was small, retroflexed and adherent, while the left tube was enlarged to the size of the little finger. On the anterior lip of the cervix there was a superficial ulcer as large as a quarter of a dollar. A diagnosis was made of tuberculosis of the lungs, tube, corpus and cervix uteri, with probable tuberculous disease of the intestines. At the autopsy this was entirely confirmed; the entire endometrium was studded with cheesy nodules, as well as the kidneys, ureters, and bladder. It is probable that the primary infection in the genital tract was situated in the tube, and that the lacerated and eroded cervix became infected through the discharge from the interior of the uterus, which began after the abortion. There was a possibility that infection had been introduced by the curette.

HÆMATOMA OF THE OVARY.

DORAN (*Trans. London Obstetrical Society*, vol. xxxii., 1890) met with the following case of apoplexy of the ovary without rupture: The patient was

admitted to the Samaritan Hospital six months after a sudden attack of pain in the right side of the abdomen. Soon after this attack an abdominal tumor was observed, round, elastic, and freely movable. When examined previous to the operation a mass the size of an orange was felt high up in the right broad ligament. Laparotomy was performed by Mr. Thornton, who removed from the right side a body "resembling a boiled suet dumpling," which was at first thought to be a pedunculated subperitoneal fibroid. On section this was found to be the enlarged ovary, the centre of which was occupied by a large cavity containing a hard blood-clot. It was evident that the original coagulum had contracted considerably, thus accounting for the diminution in the size of the tumor. There was no evidence of hæmatocele. This was an example of follicular hæmorrhage, such as has been described by Winckel and Olshausen, but the follicle had ruptured under pressure, leading to an effusion of blood into the stroma and involving imminent danger of rupture of the cortex of the ovary and fatal intra-peritoneal hæmorrhage.

BOLDT reported at the recent International Medical Congress a successful case of laparotomy for peritonitis, due to the rupture of a hæmatoma of the ovary. The patient stated that on the day preceding his first examination she had been seized with a sudden pain in the left ovarian region, and at once became unconscious. On admission to the hospital she had general pain in the abdomen and vomited frequently, her temperature ranging from 102.5° to 103.7°, and her pulse being 120 to 130. Vaginal examination was negative, but it was inferred that a pyosalpinx had ruptured. As she grew rapidly worse, the abdomen was opened two days later, and a quantity of bloody serum escaped. Nearly a quart of fluid and coagulated blood was removed from Douglas's pouch, and the left tube and ovary were removed, the right being normal. The cavity was irrigated, closed, and the patient made a rapid recovery. An examination of the specimen showed that it consisted of the nearly normal tube and a large ovary, on the posterior surface of which was a ruptured hæmatoma. Microscopically the growth appeared to be an endothelioma, which had become transformed into an angioma, as described by Dr. Mary A. Dixon Jones.

STRICTURE OF THE URETHRA IN WOMEN.

VAN DE WARKER (*New York Medical Record*, August 23, 1890) claims that non-traumatic stricture of the urethra in women is far more frequent than gynecologists admit, the failure to recognize its presence being due to improper methods of examination. Instead of using ordinary sounds to measure the calibre of the canal, he employs bulb-pointed bougies, which indicate minor degrees of contraction, such as are more common in women than are the tight strictures met with in the other sex. Contractions are usually found in the lower half of the canal, and are not infrequently arranged in groups, so that a No. 24 or 27 F. exploring bulb, when gently introduced slips along with a series of jerks with only a slight feeling of resistance. The resulting symptoms are due not so much to the existing contraction of the lumen as to the amount of local irritation. The patient gives a history of frequent and painful micturition, which may be relieve

for days or weeks at a time, or she may have no trouble until she has been on her feet for several hours; loss of control may be present. Mechanical obstruction is absent. The most common form of stricture is annular contraction of the meatus, ranging from 13 to 20 F. The treatment consists in gradual dilatation with steel sounds, incision being seldom required. Prolapse of the urethral mucous membrane is merely another form of stricture, as will be seen on introducing a bulb, and can be cured by dilatation, with or without excision of the redundant tissue. The operation should be repeated two or three times a week, and prolonged treatment is often necessary. The writer has had no experience with electrolysis as recommended by Fissiaux, but disapproves of it as a painful method presenting no advantages over dilatation.

ENDOSCOPY OF THE FEMALE URETHRA IN GONORRHOEA.

JANOVSKY (*Wiener med. Presse*, September 7, 1890) has practised endoscopy according to Grünfield's method in a large number of cases of gonorrhœa in the female, and has thus added considerably to our knowledge of the pathology of the disease. Examinations during the acute stage are difficult, it being necessary first to apply cocaine to the canal on account of its extreme sensitiveness. Acute gonorrhœa may be circumscribed or diffuse. The mucous membrane is much swollen, with collections of pus between the folds. The walls may be covered with small abscesses; Skene's lacunæ contain pus in which gonococci can always be found. Erosions and circumscribed hæmorrhages are frequent. A peculiar herpetic form of urethritis (non-specific?), often seen in prostitutes, presents appearances similar to those observed in the subacute stage of gonorrhœa. Two varieties of the chronic form are to be distinguished, one of which, corresponding to chronic urethritis in the male, is represented endoscopically either by separate nodules or by diffuse swelling of the mucosa, or the glands and lacunæ may be principally affected. The granular form originates in the lacunæ.

INJURIES DURING COITUS.

This subject, which possesses considerable interest from a medico-legal standpoint, is well illustrated by the following cases:

SPAETH (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix., Heft 2) calls attention to the danger of allowing coitus to take place too soon after a lacerated perineum has been repaired, and reports two unique cases. The patients were discharged from the hospital within a month after perineorrhaphy had been performed. In both instances intercourse occurred within two or three days after their return home, and transverse tears were caused in the posterior vaginal fornix, from which profuse hæmorrhage resulted which necessitated the application of sutures. It was remarkable that the injury occurred, not in the fresh cicatrix, but in the vaginal vault, which might be explained by the fact that the posterior wall of the vagina was shortened and thus put on the stretch in consequence of the operation.

Another woman, perfectly healthy, married at the age of thirty-one and from the first had pain during coitus. A few days after marriage she had violent pain during the act, which was followed by profuse hæmorrhage.

Four days later fecal matter escaped *per vaginam* while she was at stool. On examination the external genitalia were found to be normal. The columns of the posterior vaginal wall were torn away from their attachment, and there was a recto-vaginal fistula admitting the little finger.

HOFMOKL (*Internationale klinische Rundschau*, September 28, 1890) reports four cases that occurred in Vienna and Prague. In one case a powerful young man had intercourse with a widow, æt. fifty-eight, causing a tear in the vaginal fornix with profuse hæmorrhage.

In the second, violent coitus in a sitting posture produced a rupture of the posterior fornix involving the peritoneum; the patient lost much blood, but recovered.

The third case was that of a girl, æt. seventeen, whose lover had violent intercourse with her while she was in an exaggerated lithotomy position, causing a large tear in the right wall of the vagina.

The fourth case was that of a young girl who had an undeveloped vagina with absence of the uterus and adnexa. During a forcible and unsuccessful attempt at coitus she sustained a deep laceration of the left labium majus, which was torn away from the vaginal wall. The tear extended upward into the *mons veneris* and downward toward the rectum, while the finger could be introduced into the vaginal wound to the depth of two inches. Profuse parenchymatous bleeding was checked by pressure, and the patient was discharged at the end of four weeks cured, but still anæmic from the loss of blood.

In Spaeth's case of recto-vaginal fistula (the sixth on record), the injury did not occur during the first coitus, but after several successful attempts had been made; it appeared to be due not to any disproportion between the introitus and the male organ, but to an abnormal thinness of the recto-vaginal septum associated with a broad, resistant perineum. He classifies the different injuries as follows: Deep tears of the hymen, with profuse hæmorrhage, tears of the clitoris, of the urethra (in cases of atresia hymenis), vesico-vaginal fistula, laceration of the vaginal fornix (usually the posterior or lateral), and of the septum in a duplex vagina, to which should be added injuries of the vagina from premature coitus after perineorrhaphy.

GONORRHOÆAL SALPINGITIS.

MERGE (*Med. Anzeiger zum Centralblatt für die Ges. Med.*, September 13, 1890), in his bacteriological examinations of the contents of the tubes from twenty-six cases of pyosalpinx, was able to demonstrate the presence of microorganisms in eight instances, Neisser's coccus being found in three specimens of pus. Bumm denied that contact of the gonococci with the peritoneum could produce a special variety of peritonitis, since only cylindrical epithelium was vulnerable as regards these microorganisms. Koch considers this question as still unsettled. The writer believes that if gonococci are found in pus within synovial cavities which are lined with a serous membrane, it is possible that the peritoneal cavity may contain similar pus. They may have existed and have been destroyed, so that we are not yet in a position to deny positively the possibility of a specific peritonitis due to the escape of gonorrhœal pus from the tubes.

KRAUROSIS VULVÆ.

ORTHMANN (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix., Hest 2) reports five cases of this peculiar form of atrophy of the pudenda, which was first described by Breisky, in a paper based upon an analysis of twelve cases. The latter describes the condition as an atrophy of the skin covering the external genitals, in consequence of which even the introduction of the finger into the vagina causes fissures in the soft parts. The introitus may become so narrowed as to interfere with coitus and parturition. Microscopical examination of sections of the affected skin show that there are retrograde changes in the upper layers of the corium, causing sclerosis of the papillæ, the rete being so thin in many places that the horny epidermis rests directly upon the papillæ. Sweat and sebaceous glands are absent.

Regarding the etiology of this peculiar affection, nothing is known. Treatment is useless. Fleischmann later reported eight cases, confirming Breisky's observations, and Janovsky six, the latter believing that long-standing blennorrhœa was a prominent etiological factor. Orthmann's careful studies led him to the same conclusion as Breisky, that the cause of this affection is unknown. In his cases there was excessive itching and burning, while in those of other observers this symptom was rarely present.

All the cases presented the characteristic appearances described by Breisky—smoothness, dryness and cicatrization of the skin, atrophy of the labia, and stenosis of the introitus. With regard to the treatment, after employing baths, lotions, and ointments in vain, Martin (who treated the patients in his private hospital) excised the diseased parts *in toto*, obtaining good union of the extensive wounds and complete relief of the distressing irritation, of which there had been no recurrence. Cases were reported by Schröder and Küstner, in which obstinate pruritus vulvæ was similarly treated with good results, but kraurosis has never before been treated surgically.

PÆDIATRICS.

UNDER THE CHARGE OF

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CREOLIN FOR CERTAIN DISEASES OF THE NEWBORN AND NURSING
INFANTS.

In ten cases of purulent ophthalmia in the newborn, SCHWING (*Arch. Ital. di Ped.*, 1890) used a one per cent. solution of creolin by irrigation. In two mild cases a cure resulted in six days. In the other eight it was used four or five weeks without satisfaction. A one or two per cent. solution of nitrate of silver was then used with better results.

In eleven cases of muguet and aphthæ, chlorate of potash, hypermanganate of potash, and boric acid were used for a long time without satisfaction. A one-per-cent. solution of creolin was then used five or seven days and produced complete cure. In omphalitis in the newborn, pure creolin, in the form of an unguent, was followed by disappearance of all inflammation in four days. Creolin rubbed upon erysipelatous patches gave gratifying results. The following formula gave good results in acute gastro-enteritis in three to six days: Creolin, 2 to 3 drops; canella water, two and a half ounces; syrup, five drachms. For young infants a teaspoonful was given every hour. For larger infants give creolin, fifteen grains, white sugar, seventy-five grains. Divide into five or ten powders, and give one or two daily.

In the surgical diseases of children asepsis of the surface and cavities of the body may be obtained with a one-half or one per cent. solution of creolin, and there need be no fear of toxic phenomena such as may follow the use of carbolic acid or sublimate.

ANTISEPTIC PRECAUTIONS IN THE HYGIENE OF NEWBORN INFANTS.

EPSTEIN (*Jahrb. f. K.*, xxxi. 1, 2) considers that our knowledge and opinions in regard to infection and infectious disease have thus far taught us nothing in regard to the treatment of a disease which is already in progress. In other words, there are no specific antidotes. But in the way of prophylaxis much may be done, and notably so in diminishing the mortality from pyo-septicæmia in the newborn, a disease which is common both in public and private practice. Its diagnosis at this period of life is not easy, for fever and chill may be absent, nothing can be learned by interrogating the patient, and even post-mortem organic changes may not be demonstrable. A common accompaniment of the disease is intestinal catarrh, also a marked debility which may exist from birth. The disease is rarely acquired *in utero* or *inter partum*. Septic matter from without enters most frequently by the navel, but may enter through other avenues. The danger of navel infection is greatest during the first few days of life. Infection through the mouth may occur in diphtheria, septic croup, and aphthæ. Infection may be due to the aspiration of poisonous amniotic fluid, or to contact with the diseased genitals of the mother. Sepsis may develop insidiously, and suppurating processes not appear until months have elapsed. Prophylaxis should begin with most careful treatment of the umbilical cord, the object being to produce mummification as speedily as possible. Cleanliness on the part of the physician, nurse, and mother is indispensable. Crêde's method of instilling one drop of a two per cent. solution of nitrate of silver into each eye at birth should always be practised as a preventive of blennorrhœa. If artificial feeding is a necessity, sterilized milk should invariably be used.

THE SURGERY OF HERNIÆ OF THE SPINAL CORD.

BOYER (*Jahrb. f. K.*, xxxi. 1, 2) has operated upon two cases for lesions of this character. The first was in an atrophic male infant ten days old with a meningo-myelocœle as large as an apple in the lumbo-sacral region. The skin covering the tumor was red and inflamed, and already necrotic. There was

an opening of a finger's breadth in the region of the last two dorsal and first two lumbar vertebræ. The necrotic portions were disinfected and removed, and two lateral flaps made from the skin surface of the tumor; then the tumor was opened, the cauda equina separated from its inner wall and carefully laid in the spinal canal. The sac was removed and the wound carefully sutured. The sutures were removed on the fifth day. On the nineteenth day cerebro-spinal fluid trickled from a small fistula which remained after the rest of the wound had healed. This drainage continued six days, and then a silk suture was extruded through the fistula. The child did well for a time, but died at the end of two months. It was subsequently ascertained that the scar of the wound had ulcerated, and had been very imperfectly cared for. The cranium had become greatly enlarged, and there were extensive myosis and hemiplegia, with paralysis of the left facial and hypoglossus.

The second case was that of a well-nourished child ten months old with a meningocele upon the posterior half of the greater fontanelle, and a meningo-myelocele, cystic in character, as large as a child's head, in the lumbo-sacral region. There was paresis of both lower extremities with incontinence of urine and fæces. After an unsuccessful but harmless puncture of the tumor, 880 cubic centimetres of cerebro-spinal fluid being withdrawn, the radical operation was performed. Two transverse skin flaps were made, the tumor was ligated and removed. In the posterior wall of the cyst and at its upper pole there was a portion of the spinal cord six centimetres in length, the cavity being bounded posteriorly by the spinal cord, but everywhere else by the arachnoid membrane. The cord running in the posterior cyst wall contained a central cavity, which was lined with cylindrical epithelium. Within one month the child seemed to be entirely well.

THE IRRIGATION OF THE STOMACH IN THE NEWBORN.

As opposed to Ebstein's proposal to irrigate the stomach with the child in the dorsal position FAUCHER (*Jahrb. f. Kinderh.*, xxxi. 1, 2) proposes to hold the head of the child forward in order to prevent the contents of the stomach from slipping back into the pharynx. The arms of the child are to be secured behind with a napkin, then the gastric end of the stomach sound is placed in the child's mouth, which will cause sucking and swallowing movements. This will enable one to pass the sound into the pharynx. When the sound has been pushed well into place it may be held by the same one who holds the child. Then the irrigation with alkaline water may be accomplished in the same way as with an adult. A case is narrated of a strong male infant, nursed at the breast, who had vomited much of mucus and coagulated milk from the first few days of life. The mother had an abundance of milk, and had made the mistake of nursing the child too frequently. On the twenty-seventh day this child, which was strong at birth, was reduced to a skeleton, his skin was of a grayish color, his face shrivelled, his cry was feeble, there was obstinate constipation and almost constant vomiting. The indication for irrigation of the stomach seemed most urgent, and it was performed three times daily for two days, and then twice daily. The vomiting stopped, and only gas was passed. Then the food was kept down a longer

time, and began to be digested. The child began to sleep, its stools became normal, its skin natural. The washing was continued once a day by the mother until the end of the fourth month.

THE BEARING OF INANITION UPON INFANTILE MORTALITY DURING THE FIRST MONTH OF LIFE.

NASI (*Arch. Ital. di Ped.*, May, 1890) gives the following:

1. The ultimate cause of the greater number of deaths during the first month of life is inanition.
2. It may exist in those who are apparently strong at birth as well as in those who are congenitally feeble.
3. Proper nutriment is a first consideration, and it must be given in a proper way.
4. Maternal nourishment is the best. It may be given direct from the breast, or by means of a nursing-bottle. For feeble children the bottle will be required.
5. A form of nursing-bottle is recommended which will answer all requirements.
6. If a wet-nurse is to be substituted for the mother, one must be obtained whose recent confinement will cause her to be a proper substitute.
7. If a wet-nurse is impossible, or if the milk of the wet-nurse contains colostrum corpuscles, a suitably-prepared milk should be given.
8. The vessel in which the milk is prepared should be aseptic.
9. Milk thus prepared may be the most satisfactory form of nourishment, especially for infants who are too feeble to suck.
10. In a few cases forced nourishment will be required, and by such means six months' infants may sometimes be reared.
11. Artificial nourishment, while not advisable in general, will yield better results according as the hygienic surroundings are favorable.
12. Mixed alimentation will sometimes give the best results, and by such means infants will frequently be saved who would otherwise die of inanition.

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